policy studies

#12

Pension reform

Ukraine's pension system does a poor job of protecting pensioners from poverty, and workers do not have reliable saving mechanisms. Realising the necessity to conduct pension reform, the government has developed a draft law that envisages reforming the solidarity system and introducing a mandatory accumulation system.

The mandatory accumulation system is expected to increase social protection of the poorest societal strata, provide workers with a saving mechanism for their retirement, and increase the supply of capital in the economy. However, successful implementation of the system requires a favourable economic situation in Ukraine, personification of pension accounts, proper regulation of the newly created private pension system, and public awareness of the risks and benefits of the new system.

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Introduction

Ukraine's present pension system does a poor job of protecting the elderly from poverty. State pensions are too small to allow elderly people to pay for basic food, shelter, clothing, and other essential goods and services – although exactly how far pension benefits are below a reasonable measure of the poverty level is impossible to measure accurately, because Ukraine has still not established a poverty level. Most Ukrainian pensioners rely on family members and on food grown on their private land plots, or continue working in order to survive.

Another issue is equity. Today, there is not much difference between a pension received by someone who worked for only five years – 46 UAH per month – and the average pension received by retirees who worked most of their lives – 65.88 UAH. Few people think this is fair or desirable.

Despite providing such low pension benefits, the state pension system requires enterprises to pay a high contribution rate in order to raise enough money to pay out benefits; and even then, pensions are often paid late. The high contribution rate, combined with the low level of benefits (especially for individuals with high wages), has encouraged enterprises and individuals to move into the shadow economy, where they avoid paying both pension benefits and income taxes. Of an estimated 24 million Ukrainian workers, only about 16 million are making regular contributions to the Pension Fund.

The present Ukrainian pension system does not provide working people with safe financial systems for saving for their own retirement. Millions of Ukrainians lost most of their lifetime savings during the hyperinflation of 1993-94. Many people who invested in the private pension funds that were created in the early 1990s also suffered losses when many of the funds collapsed. Most people do not have sufficient confidence in commercial banks because many of these are not secure, and successive devaluations of the Ukrainian currency and renewed double-digit inflation have eroded the real value of savings accounts. As a result of the low level of savings in Ukrainian financial institutions, there is insufficient capital to meet Ukrainian enterprises' desperate need for more short-term and long-term capital.

As Ukrainians live longer, and as the number of working Ukrainians shrinks because of today's low fertility rate, these problems will get worse.

The government of Ukraine and the Verkhovna Rada have been debating the reform of the state pension system for several years. In April 1998, the President of Ukraine approved the basic reform policy, following which the Cabinet of Ministers has already developed two draft laws. The draft Law "On Mandatory State Pension Insurance" was submitted by the government to the Verkhovna Rada in August 2000.

Projections in this report—prepared by Mitchell Wiener, an expert from the PADCO company—examine the financial sustainability of the Pension Fund of Ukraine, under the present law and under the new law submitted by the government. Particular emphasis is given problems with the existing pension system and difficulties associated with implementing the new Law.

Achieving the goals of the pension system

Pension systems have two major goals–to guarantee a minimum standard of living for all old people and to establish safe means through which working people can save money for their own retirement. However, achievement of these goals involves numerous problems. In order to overcome them, most governments have developed so-called three-pillar pension systems. This same strategy is envisaged in the "Basic Policy on Pension System Reform in Ukraine", approved by the President of Ukraine in 1998.

Defining the goals of the pension system

Generally, pension systems have two major goals: to guarantee a minimum standard of living for all old people and to establish safe means through which working people can save for their own retirement. However, achievement of the two goals simultaneously is not an easy task.

Concern for the elderly has become a central part of government policy in Ukraine, as people live longer and an ever-larger share of the population is of pensionable age. Many elderly people can no longer be expected to support themselves by working. Consequently, the following two major goals of the pension system were determined:

- to guarantee a minimum standard of living for all old people; and
- to establish safe means through which working people can save money for their own retirement.

Unfortunately, the twin goals of the pension system often work against each other. This is one of the reasons why the debate over pension policy in Ukraine is so difficult. If the government guarantees a minimum standard of living for all old people, for example, many working people may not bother to save as much for their own retirement. They may ask themselves, why sacrifice expenditures today if the government will provide pension benefits in the future? At the same time, if the government continues to pay large benefits from the pay-as-you-go system, working people will have to pay larger payroll contributions today – encouraging them to work in the shadow economy where the burden of such contributions is smaller.

Creating a safe system that lets people set aside money for themselves is proving just as difficult as creating a pension

system that provides adequate and equitable benefits. The problem is that the managers of financial institutions are not always competent or honest. When workers place money into a pension fund that they will not need for 10 or 20 years, there is strong temptation to use it for risky investments, or simply to steal it.

In an unfettered situation, enterprise managers in the West might be no more honest than those in Ukraine, but, as financial institutions evolved there, so too did laws and regulatory systems, in order to oversee private financial institutions and keep incompetence and mismanagement to a minimum. Well-paid regulators strictly enforce these laws and regulations. The overall result has been the evolution of highly trained and skilled financial experts working in private financial institutions, whose high salaries reflect their measured performance rather than their close political contacts.

The three-pillar pension system

There is no single pension program that overcomes all mentioned problems.[1] Therefore, most countries have developed pension systems that have separate parts: a solidarity system, a mandatory accumulation system, and a voluntary accumulation system.

To overcome all problems, most countries have developed pension systems that have separate parts: a solidarity system, a mandatory accumulation system, and a voluntary accumulation system. The result is often referred to as a "three-pillar" pension system.

The solidarity system ensures that everyone, regardless of how much or how little they worked, receives at least something after they retire. These benefits are not always provided through a pension system, though. They are sometimes provided through the nation's social assistance system – government-financed benefits paid to the poor. For example, if the government provides for a guaranteed minimum income for all families, then the elderly, as well as single mothers and other poor people, can be paid benefits that ensure that they can afford basic food, clothing, and shelter. Such welfare programs do not necessarily have to be financed through payroll contribution, but can be find out of general government revenues.

Since such a solidarity, or welfare, system can usually afford to pay monthly benefits that are small relative to prevailing wages (in the United States, Social Security payments are only 35% of an average income before retirement), the solidarity

[1] See Appendix A for a profile of pension systems in different countries of the world.

system is usually supplemented by other pension programs. These other programs allow people to accumulate savings for their own retirement. To overcome the problem that guaranteed benefits to the elderly discourage people from saving enough for their old age, these pension savings programs may be made mandatory.

Mandatory accumulation systems require working people to pay a certain amount of their wages into individual savings accounts. The money is invested, and participants are allowed to withdraw the money (plus the income earned on investments) only when they have reached retirement age. The solidarity system retains the responsibility of paying benefits primarily to those people who have not accumulated enough money in their individual accounts to provide them with an adequate retirement income.

In practice, most solidarity systems pay a basic benefit to all retirees – although they may provide additional benefits to those retirees with no other sources of income. In the United States, for example, the Social Security system pays special benefits to elderly people with no work experience. Most solidarity systems calculate benefits based on past years of work and wages, but set a maximum benefit so that very high income people do not receive very high benefits – allowing the system to redistribute money from high wage contributors to low wage beneficiaries. The maximum benefit in most countries is an indirect result of a wage cap. Usually, contributions are only required on wages up to a maximum limit. This same limit is then used when calculating benefits.

For some people, particularly those who earn high wages and want to maintain their standard of living after retirement, the combination of benefits from the solidarity system and the mandatory accumulation system may not provide enough savings. For these people, a third type of pension program is often provided: a voluntary accumulation system that allows people to pay into individual accounts and withdraw the money (plus accumulated investment income) after retirement.

The overall result is often referred to as a “three-pillar” pension system: a solidarity system that meets the goal of protecting the elderly from poverty; a mandatory accumulation system that ensures working people will receive additional pension benefits after retirement, and a voluntary private pension system for people who want even higher incomes after retirement and can afford to pay higher contributions during their working lives.

However, not all countries have taken this approach to pension reform. Some have tried to eliminate their solidarity systems entirely. The first country to attempt full privatisation of its pension system was Chile, in 1981. It created a mandatory accumulation system in which funds were managed by private pension funds. The Chilean approach has won many supporters throughout the world.[2] At the same time, almost all Central and Eastern European countries have reformed their pension systems, choosing to introduce some version of the three-pillar system.[3]

Perhaps the overriding lesson from the experience accumulated to date, is that the process of implementing a radical restructuring of the pension system is more difficult than it may first appear. Those countries that have failed to put in place the right administrative and regulatory infrastructures, and failed to pay careful attention to the financing of transition costs, are all suffering from severe growing pains.

Current state of pension reform in Ukraine

In 1998, President Kuchma approved the "Basic Policy on Pension System Reform in Ukraine". The policy envisages creation of a three-pillar pension system in Ukraine. To establish the new system, the government has already developed two draft laws.

In April 1998, Ukrainian President Leonid Kuchma approved the "Basic Policy on Pension System Reform in Ukraine", supporting the retention of part of the solidarity system, to provide basic benefits (the first pillar); a mandatory accumulation system, under which people are required to contribute to individual accounts (the second pillar); and a voluntary private system through which people who can afford to, may save (the third pillar).

Of course, the relative size and strength of the three pillars must depend on the prevailing economic and fiscal conditions. In Ukraine, with its very low average wage and chronic national budget deficits, fighting severe poverty among the elderly must take priority over providing savings opportunities to the relatively few well-paid workers – at least, today. Therefore, the solidarity system will be larger than any man-

[2] For a description of the Chilean experience with pension reform, see L. Jacobo Rodriguez, "Chile's Private Pension System at 18: Its Current State and Future Challenges," *Report No. 17*, The Cato Institute Project on Social Security Privatisation, Washington DC, July 30, 1999.

[3] See "The Central and Eastern European Experience with Pension Reform," *PADCO Pension Policy Report No. XX*, January 2000.

datory or voluntary savings system in Ukraine for many years to come. The savings component of the pension system will grow as real wages grow.

To implement this three pillar system – which the World Bank has endorsed as an approach that meets the needs of most countries – the Cabinet of Ministers of Ukraine has developed two draft laws: "On mandatory state pension insurance" and "On non-government pension programs".

The draft Law "On mandatory state pension insurance" was submitted by the government to the Verkhovna Rada in August 2000.

Evaluating the performance of Ukraine's present pension system[4]

Under the present legal structure, and allowing for modest increases in maximum and minimum pensions, the Pension Fund of Ukraine will be in actuarial balance over the next 75 years. However, despite the favourable financial projections, the present system fails to meet basic criteria of a good pension system. This failure is caused by a number of problems within the system, including low retirement age, low and inadequate pension benefits, excessive number of privileged pensioners, etc. Many of these problems are to be resolved by the new draft Law.

Basic assumptions of the analysis[5]

Any projections of pension benefit payments and revenues to the Pension Fund depend on making assumptions about what will happen to the Ukrainian economy and population in the future. Every effort has been made to make the assumptions as accurate as possible, and to ensure that the relationships among the assumptions are reasonable. However, as the tumultuous events of the past decade demonstrate, any assumptions about the future may turn out to be mistaken. Nevertheless, without making assumptions, projections are impossible and policymakers would be condemned to make decisions without any information at all.

Projections of pension benefit payments and revenues to the Pension Fund depend on making assumptions about what will happen to the Ukrainian economy and population in the future. To keep the projections as accurate as possible, these assumptions must be updated regularly as new data becomes available.

It is also important to remember that projections are not prepared just once (during the preparation of draft laws, for example). Each year, or even more frequently, projections must be updated by comparing actual results with what was expected and, if necessary, underlying assumptions must be modified. This ongoing process should be the responsibility of an Office of the Actuary within the government.

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[4] Appendix B provides some important indicators of the economic situation and the pension system in Ukraine over the past years. As well, see Appendix C for detailed information on the present pension system of Ukraine.

[5] For a detailed methodology and data sources of the analysis, see Appendix D.

Actuaries are experts in insurance and pension mathematics, and are responsible for financial analysis of pension systems throughout the world. All national social security systems in the West have an Office of the Actuary, and it is responsible for analysing the financial status of the pension system and recommending changes to keep it in actuarial balance.

The economic scenario

The state of the economy has immediate and large impacts on the revenues flowing into the pension system. The basic macroeconomic statistics used for this analysis were prepared by ICPS as its estimate of the most reasonable economic scenario and are summarised in the table below.

Table 1. Macroeconomic scenario (percent annual changes in key variables)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011-2020	2021-2040	2041-2073
Real GDP	-0.4	2.5	3.5	4.0	4.5	5,0	4.5	4.0	3.5	3.5	3.0	3.0	4.4	3.6	2.6
Real wage	-5.4	1.0	2.0	3.5	4.0	5.0	7.5	7.0	5.5	5.0	4.5	4.5	5.1	4.1	3.2
Inflation	22.7	28.5	15.6	12.9	11.0	9.0	8.0	7.0	6.0	6.0	5.5	5.0	5.1	4.2	3.5

Source: The economic scenario was developed for this analysis by ICPS.

This pattern is consistent with the growth rates for transitional, post-socialist economies in Eastern Europe – although with more modest growth rates for real GDP and real wages than in Poland or Hungary, for example, because of Ukraine's slower pace of economic reform.

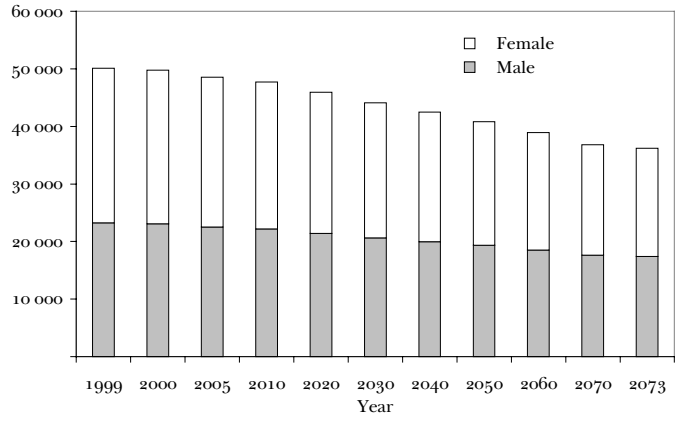
Real wages are assumed to begin to grow in 2000, but to remain at or below GDP growth from 2000 through 2004. Only in 2005 do real wages begin to grow more rapidly than real GDP – reflecting the productivity gains expected as unprofitable state enterprises are liquidated or modernised and the workforce becomes more productive.

The demographic scenario

While the economy is a major factor in determining revenues to the pension system, the size and age of the population is the major determinant of the size of the labour force and the relative number of children and retirees to workers. Chart 1 below shows the population projections for Ukraine for the next 75 years. The overall population is expected to decrease by more than 20% over this period.

Chart 1. Population

thousands



The size of the population is affected by:

- the number of babies born each year;
- the number of deaths each year;
- the number of people moving into or out of Ukraine.

NUMBER OF BABIES BORN EACH YEAR. This is determined by the number of women of childbearing age and the fertility rate – the number of babies born to a woman during her lifetime. The fertility rate varies significantly by country and over time. In Ukraine today, the fertility rate of 1.3 children is at its lowest level in history. Any fertility rate below 2.0 obviously leads to a decline in the population, since couples are then failing to replace themselves. In the 1950s and 1960s, Ukraine's fertility rate exceeded 2.0 and the population grew. But with deteriorating economic conditions and the easy availability of abortions, the birth rate has declined. Most Ukrainians simply cannot afford to raise children.

However, as economic conditions improve, many demographers expect the fertility rate to increase from its current level of 1.3 to about 1.8. Even so, this will not be enough to prevent the population from continuing to shrink. Paradoxically, as economic conditions improve, the birth rate will not return to its level in the 1950s. In rich countries, high income families remain small because the opportunity cost of having children – in terms of lost income to women remaining at home caring for children – is higher.

NUMBER OF DEATHS EACH YEAR. Today, by worldwide standards Ukraine suffers from high mortality rates—the result of a decline in the quality of health care, stress caused by wrenching economic and social changes, and the overall decline in the standard of living. Life expectancy at birth is about 63 years for males and 73 years for females, a result of the high mortality rates among babies and small children.

A Ukrainian female who lives to the pension age, however, can expect to live for another 22.6 years; a man who lives to be 60 can expect to live a further 14.2 years. Consequently, those who survive to pension age can expect to live considerably longer, though still less than in the United States or Western Europe.

Over time, mortality rates will fall. But because the population is ageing and fertility rates are low, the crude death rate (number of deaths per 1,000 members of the population) should continue to exceed the crude birth rate, resulting in a declining population.

NET MIGRATION (PEOPLE MOVING INTO OR OUT OF UKRAINE). Since independence, many people have left Ukraine seeking better economic conditions in the USA, Canada, Germany, or Israel. Some Tatars, on the other hand, have returned from Central Asia to their homeland in Crimea. Still, there has been a net loss from out-migration. Many demographers expect Ukraine to have more immigration than emigration in the future, as people from poorer parts of the former Soviet Union, particularly from Central Asia, come to Ukraine seeking a better life (this trend was observed in Ukraine during Soviet times). However, even if net immigration occurs, it is unlikely to reverse the overall population decline.

Under the present legal structure, the Pension Fund of Ukraine will be in actuarial balance over the next 75 years and will show an overall surplus. This balance is achieved at the expense of a falling ratio of average pensions to average wages over time and, in the immediate future, of continued low pension benefits.

Financial sustainability of the Pension Fund[6]

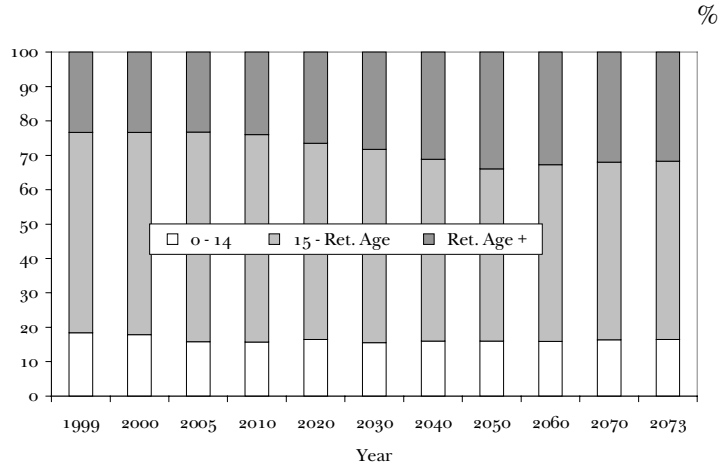
Number of people working and the number of contributors

The ageing of the population over the next 75 years, shown in Chart 2 below, will mean a growing number of pensioners

[6] The projections in this report do not examine the pension systems from the perspective of different groups of workers and pensioners. This is an important perspective and should be the subject of detailed study in the coming months, as the draft law is debated.

relative to the active workforce. For purposes of this chart, the number of retirees in the population is projected by assuming that all women will retire at 55 and all men at 60. The population that may work includes all people between the ages of 15 and pension age. The area at the base of each column shows the number of children – those between ages zero and fourteen. After the year 2020, the number of retirees begins to increase as a percentage of the population, while the number of workers declines. This graphically illustrates the demographic problem that will be especially severe in Ukraine between 2020 and 2050.

Chart 2. Age distribution of the population



In general, younger people tend to work less than people between the ages of 30 and 50, when most able-bodied citizens are either working or looking for work (with the exception of the disabled or those who have given up hope of finding employment). After the age of 55 for women and 60 for men, the share of the working age group declines, as people retire. Current labour force participation rates – the percentage of citizens of a particular age who are available to work—are shown in Table 2.

However, these figures determine only the labour force – the number of individuals available to work—and not the actual number employed. To estimate the number employed each year, the labour force must be reduced by the number of unemployed. Unemployment tends to vary significantly by age, with greater unemployment at younger ages and less at older ages. Adjusting the labour force for unemployment yields the

number employed in the formal and the shadow economies combined.

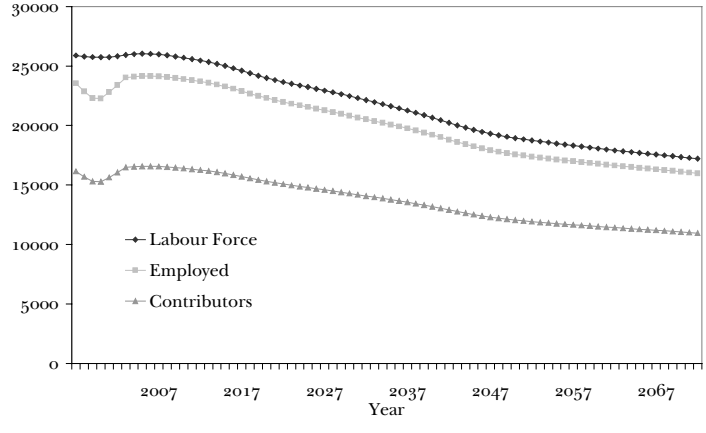
Table 2. Labour force participation rates, 1997

Age group	Male	Female
15–19	20.5%	22.2%
20–24	83.5%	74.5%
25–29	94.7%	89.5%
30–34	94.2%	91.0%
35–39	95.6%	92.4%
40–44	94.8%	92.4%
45–49	93.4%	92.6%
50–54	90.0%	84.7%
55–59	77.9%	42.9%
60–64	32.7%	24.7%
70+	0.0%	0.0%

How many workers will actually pay contributions to the Pension Fund? This is equal to the number employed less the number of those who are not required by law to contribute (such as career military officers) and those in the shadow economy (who do not pay required taxes or payroll contributions). Chart 3 below shows the projections for labour force, the number employed, and the number of those who actually contribute.

Chart 3. Labour force statistics

thousands



For this analysis, we assume no net shift from the informal to the formal economy during the 75-year projection period. Therefore, the ratio of contributors to workers stays constant. However, the relationship between the number of workers and the labour force varies as unemployment rates change.

Calculating the number of contributors is complex. Unfortunately, the Pension Fund does not know how many contributors there are, because employers pay contributions based on total wages, not on behalf of each employee. This practice is changing this year, through the creation of a personified reporting system that will allow the Pension Fund to record wages, contributions, and service credits for each employee.[7] Once this system and related databases are fully implemented, more accurate information about contributors will be available.

Despite the lack of information regarding the number of contributors, the Pension Fund does have accurate information on the total wage fund of all contributors. Information on the national average wage is available from the State Committee for Statistics. This is the average wage for workers in the formal sector working more than 50% of a standard schedule. Dividing the wage fund by the average wage yields the number of contributors, assuming everyone works full-time. Since many contributions to the Pension Fund come from part-time workers, the actual number of contributors may be higher. However, if the model calculated a greater number of contributors, the national average wage would have to be adjusted downward to compensate. In either case, the total projected wage fund and contributions to the Pension Fund would be the same.

The number of contributors shown above also includes about 2.5 million agricultural workers. These are excluded from the official wage fund statistics produced by the State Committee for Statistics, because agricultural workers pay a flat contribution and not a payroll-related contribution. We have included them among contributors, however, because the Ministry of Labour and Social Policy has informed us that agricultural enterprises will again be required to make payroll-based contributions beginning in 2003.

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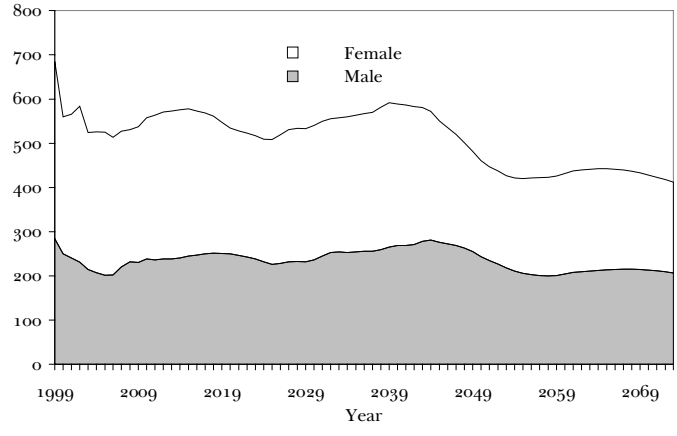
[7] See "Personifying Enterprise Reporting to the Pension Fund of Ukraine," Roger Vaughan and Mikhail Muchnik, *Labour Aspects*, January 2000.

Number of beneficiaries

The total number of Ukrainians entitled to receive pension benefits each year is projected by subtracting the number of pensioners dying each year from the number of beneficiaries receiving payments in 1998 and then adding the number of new pensioners in each year. The number of new pensioners is a function of the pension law, which stipulates pension ages and other eligibility criteria, and of how the population responds to general economic conditions.

Chart 4. New old-age pensioners

thousands



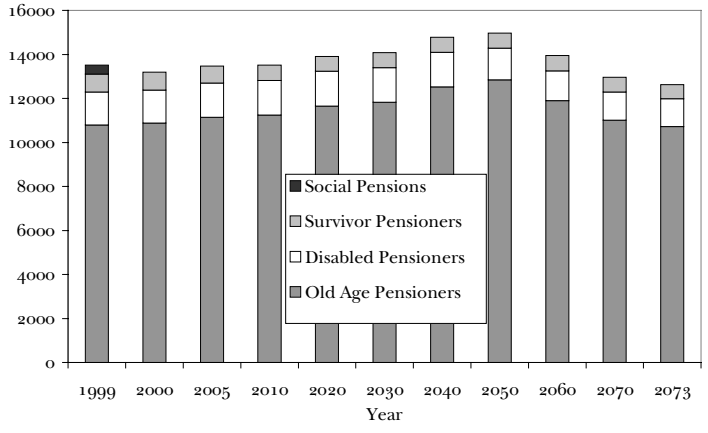
Our pension model assumes the number of people in each age group who are retired as a percent of the population remains constant over time. It projects the total number of pensioners – which tends to be far more stable than the number of new pensioners – and then it is possible to calculate the number of new retirees each year. Chart 4 above shows the pattern of new old-age retirements during the 75-year period.

During the next five years, the number of new old-age pensioners will decline because of the low number of births during the Second World War. Following the war, birth rates slowly increased, reaching their highest levels between 1960 and the early 1980s. The children born in this period will retire between 2020 and 2040. Following the economic decline that began in the late 1980s, however, birth rates fell rapidly, which will be reflected in a smaller number of new retirees at the end of the projection period.

Another factor affecting the number of beneficiaries is the government's plan to move social pensions (and other types of social payments) back to the State Budget by the end of 2001. In fact, starting this year, the State Budget began reimbursing the Pension Fund for payments to social pensioners. This will reduce the number of beneficiaries, because there will be no payments to social pensioners from the Pension Fund. Chart 5 below shows the distribution of beneficiaries by type of pension for the next 75 years.

Chart 5. Distribution of pensioners by type

thousands



The net result of all these influences is that the projected number of pensioners will rise sharply until about 2050, reaching a peak of almost 15 million, and then begin to decline. However, the percentage distribution of pensioners by type will not change much throughout the 75-year period, because we assume eligibility conditions for all types of pensions will not change.

Dependency ratios – combining contributor and beneficiary data

One of the critical factors for any pension program is the dependency ratio. In reality, there are two types of dependency ratios:

- *Population dependency ratio.* This is the overall ratio of the share of the population over retirement age specified in the law to the portion of the population of working age. It shows the theoretical ratio of the number of retirees who must be supported by each worker. The lower the ratio, the more workers there are to support each pensioner.

Ukraine will suffer from an increase in this ratio, as will other developed countries. This ratio will increase from 40.1% in 1999 to 61.7% by 2073.

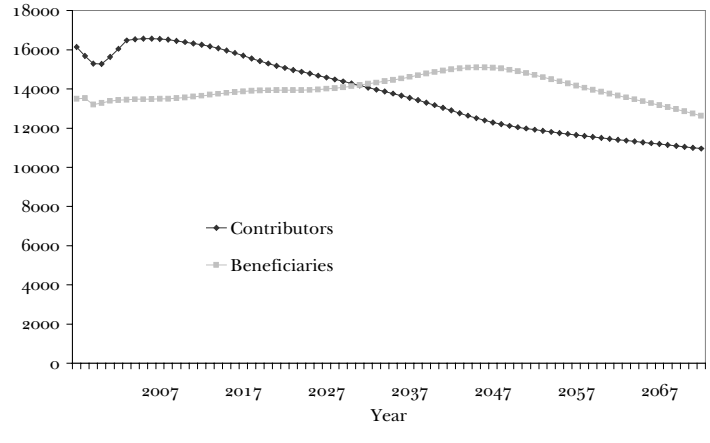
- *System dependency ratio.* This is the ratio of actual pensioners to workers paying contributions, and can be very different from the population dependency ratio. The system dependency ratio in Ukraine is higher than the population dependency ratio because many people are permitted to retire earlier than the standard retirement ages in the law, because of the large number of disabled pensioners and people receiving survivors' pensions, and because many potential contributors are unemployed, disabled, students, or evading contributions by working in the shadow economy. This ratio is projected to increase from 86.3% in 1999 to 116.3% in 2073.

Chart 6 below shows the relationship between the number of contributors and the number of beneficiaries in the Ukrainian pension system.

As can be seen, the number of contributors exceeds the number of beneficiaries until 2032, when an important statistical event occurs: the number of pensioners begins to exceed the number of contributors. After that, Ukraine's pension system suffers its worst demographic period, with the number of beneficiaries peaking in 2046 while the number of contributors continues declining. However, toward 2073, the gap between the number of beneficiaries and the number of contributors narrows.

Chart 6. Contributors and beneficiaries

thousands



Payroll contributions

The actual contributions to the Pension Fund each year must be projected from projections of the number of contributors. Revenues to the Pension Fund are a function of the number of contributors, their average wage, the contribution rate, the wage cap on contributions (the maximum amount of wages upon which pension contributions must be paid), and the rate of compliance in paying contributions. Adjustments must also be made for certain workers – those who are self-employed, for example – who pay a flat contribution rather than a payroll contribution.

For 1999, the average wage for employees working full-time in the formal sector is projected to be 177.52 hryvnias (including both agricultural and non-agricultural workers). The payroll contribution rate is 32% for employers, and either 1% or 2% of wages for employees. Those earning over 150 hryvnias per month pay 2% of wages as a pension contribution, while those earning less pay 1%. The wage cap of 1,000 hryvnias per month means workers earning more than 1,000 hryvnias pay contributions only on the first 1,000 hryvnias.

Underpayment by contributors is more difficult to assess, but there is little question that many employers deliberately underreport the true wages of employees. Some estimates indicate that this reduces total Pension Fund contributions by up to 20%. Also, the average wage on which pension contributions are based is lower than the average wage reported above, because contributions are paid on behalf of many part-time workers, whose wages are not included in the calculation of the official average wage. The wage fund of contributors and the expected payroll contributions to the Pension Fund for selected years are projected to be:

Table 3. Wage fund and payroll contributions

billions hryvnias

Year	1999	2000	2005	2010	2020	2030	2040	2050	2060	2070	2073
Wage Fund	33.5	42.5	96.6	166.1	430.1	903.1	1,866.8	3,281.1	6,041.7	11,218.5	13,504.3
Payroll Contributions	8.9	10.9	26.9	48.1	125.6	265.9	554.1	981.9	1,822.6	3,411.5	4,116.4

Payroll contributions comprise the majority of Pension Fund revenues, but it also receives revenues from other sources, including excise taxes on purchases of automobiles, jewellery, currency transactions, and other luxury items, reim-

bursements from the United Nations, voluntary contributions by employers and individuals, and reimbursements received from employers for privileged pension payments made by the Pension Fund of Ukraine. These additional sources raise revenues by about 3.4%. It should also be noted that the agricultural flat contribution produces less revenue than would have been received from a payroll contribution. Between now and 2003, this results in a reduction of about 7.5% in expected Pension Fund revenues.

When projecting Pension Fund revenues, the most important factors are changes in the number of contributors and the growth rate of real wages. The number of contributors will decline over the next 75 years, reducing contributions to the Pension Fund. Offsetting this are inflation and the growth of real wages. If wages were to increase only because of inflation, contributions would increase each year in nominal terms but not in real terms. We assume, however, that real wages will grow, causing a real increase in contributions. The decline in contributions relative to benefit payments, therefore, will not be as severe as predicted by the rising pension system dependency ratio.

Average benefits and replacement ratios

The next step is to determine total Pension Fund of Ukraine expenditures. Most expenditures are benefit payments to pensioners. For existing pensioners, the Ministry of Labour and Social Policy reports average and total benefits for different types of pensioners in *Report Number 94*. This data also shows average and total benefits paid to those who retired in the past year.

Benefit payments to today's pensioners will decrease as pensioners die, but will increase because pensions are indexed to inflation. Pensions are supposed to be raised when the CPI (the usual measure of inflation) has grown by 5% since the last adjustment. The government, however, has been using a procedure that indexes for less than full inflation since the beginning of 1999. Based on our conversations with them, we have assumed that this procedure will continue for 2000 and 2001, and then return to the standard method.

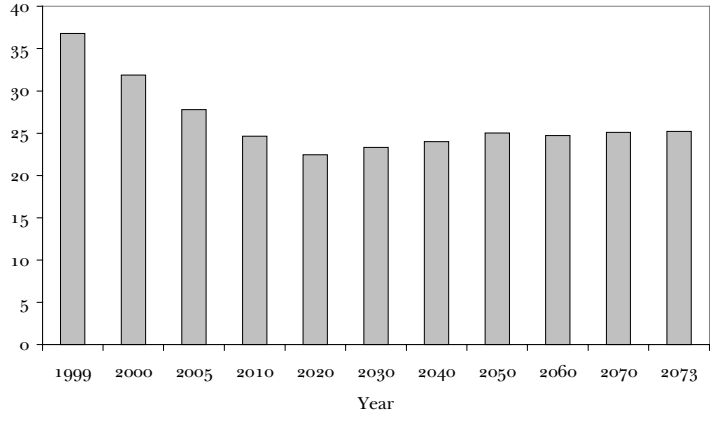
We assume initial benefits paid to new retirees will be at the same percentage of average wages as for existing retirees. This is 37.6% for old-age retirees (66.67 hryvnias divided by the average wage of 177.52 hryvnias). This implicitly assumes that the government adjusts maximum and minimum pensions in proportion to the increase in average wage. There

were, for example, increases in the minimum and maximum pension benefits, such as the recent increase effective September 1, 1999. Although normative acts do not specify this adjustment, it seems a reasonable projection of how the system will operate in reality.

Pension Fund expenditures will also be reduced by the shift of most social assistance payments to the national budget by the end of 2001. This includes pension supplements, some targeted assistance payments, certain privileged pension payments, childcare allowances, funeral allowances, etc. The projections reported below adjust for all these factors.

One useful but somewhat misleading way to look at pension benefits is to calculate the average replacement ratio for the entire pension system—the average benefits of all pensioners compared with the average wage in the economy. In countries like Ukraine that index benefits after retirement to changes in the CPI, this ratio will tend to decline as real wages grow. Average wages will increase faster than inflation, because labour productivity will improve. But we assume that new retirees will receive a pension at retirement that reflects these increases; therefore, their initial pension benefits will be a higher percentage of the average wage than those of existing retirees. Chart 7 below shows the changes in the average replacement ratio over time for the current Ukrainian pension system.

Chart 7. Ratio: Average pension to average wage



Until 2020, the average replacement ratio declines sharply because of the assumed rapid growth of real wages, and because the low number of new retirees during the next 10 or

15 years means that fewer people will be entering the pensioner population with initial higher pensions. After this date, the average replacement ratio improves as real wages grow more slowly and the number of new pensioners with higher initial pensions grows. The overall replacement ratio eventually stabilises at about 25% by 2050. This is still a low replacement rate by the standards of most countries and will create pressure on the government to find ways to raise pensions relative to wages. However, while today's 38.3% replacement ratio is well below the minimum consumption level, by 2073 the 25% replacement ratio exceeds the minimum consumption level. Therefore, the 25% benefit in 2073 is actually a far more adequate pension than the 38.3% ratio is today. This assumes the minimum consumption level grows with inflation, while the average wage grows more rapidly due to productivity increases. As we shall see below, there are only three primary ways that the solidarity system can afford to make large increases in real pensions – by raising the pension age, by eliminating privileged retirements, and by collecting contributions from a larger number of working people.

Pension Fund surplus and reserves

The last step is to combine projections of contributions and benefit payments, to give an accurate financial picture of what will happen to the current Ukrainian pension system as the economy develops and as the demographic forces change the ratio of pensioners to workers. When revenues exceed expenditures, the Fund will enjoy a surplus. When expenditures exceed revenues, it will suffer a deficit. The table below shows the surplus or deficit for selected years, and the accumulated net surplus, or "reserve", for the pension system. The reserve is projected as the accumulated "account balance", assuming surpluses are deposited in a bank account each year and deficits are paid from this bank account. Each year, the account is credited with interest on its net reserves equal to the inflation rate. If there is a positive balance at the end of the 75-year period, then the system is in actuarial balance. If there is a deficit, then it is not in balance.

Table 4. Pension Fund balance and reserves

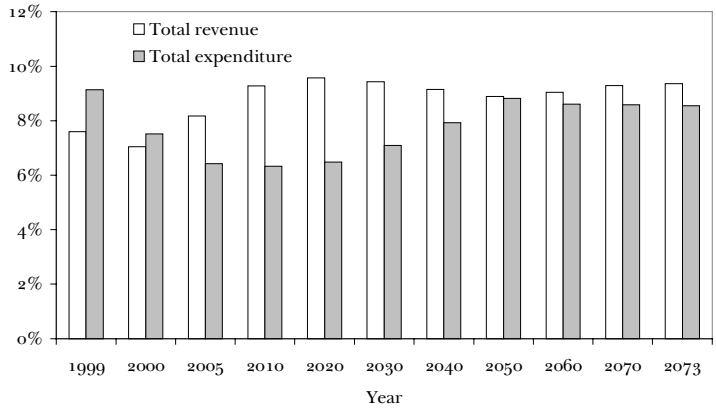
millions hryvnias

Year	1999	2000	2005	2010	2020	2030	2040	2050	2060	2070	2073
Surplus/ (Deficit)	(1.9)	(0.7)	5.9	15.6	41.3	67.0	75.1	7.9	89.2	262.4	363.9
Reserve			13.5	88.8	589.2	1,949	4,934	9,952	19,391	38,958	48,420

These projections show that the pension system will have a deficit from now until the end of 2001. Thereafter, the pension system will be in surplus, and will accumulate significant reserves. Surpluses are particularly high from 2002 through about 2030, but shrink after that date. However, it remains positive throughout the 75-year period, and at the end there is a surplus of more than 100% of GDP. This is good news for the government of Ukraine, because it indicates that the money can be used to either increase benefits, decrease contributions to the solidarity system, or divert money to a mandatory accumulation system. Chart 8 below shows the situation a different way. Revenues and expenditures are expressed as a percentage of each year's projected GDP, showing the pattern of surpluses and deficits in selected years during the 75-year period.

Chart 8. Pension Fund revenues and expenditures

% of GDP



Why does the Pension Fund show an overall surplus?

Since the Pension Fund has run a deficit for each of the past four years and until recently suffered a chronic problem with arrears, the projection of a surplus seems inconsistent. In addition, GDP and real wages have been declining for many years, and many enterprises are unable to pay their workers' wages or the Pension Fund on time. The solidarity system appears broken beyond repair. But this view of the financial condition of the Pension Fund overlooks the fact that its problems are the result, in large part, of the government's

policy of forcing the Pension Fund to pay social assistance benefits while failing to reimburse it for other payments it makes on behalf of the state budget.

Fortunately, the Pension Fund is about to enter a period of more favourable demographic and economic conditions that could assure a sound financial basis for the Pension Fund for many years to come. The primary reasons for the more favourable outlook in the next few years are the smaller number of new retirees, the anticipated decline in the number of disabled male war veterans and survivors of men killed in action during the Second World War, and the long-expected economic renewal. In addition, inflation indexing rather than wage indexing of pensions will allow contributions to grow faster than pension payments. The maximum benefit cap, even with annual wage indexing, will keep the maximum replacement ratio at 43% and the average at 38.3% for each year's new retirees.

The current level of contributions is more than sufficient to support an average replacement ratio of 38% in the near future. Based on world-wide standards, this is not an unreasonable benefit level for a solidarity system. But this average conceals two disturbing facts. First, because of Ukraine's very low real wages in comparison with other countries, a replacement rate of 38% does not provide the average pensioner with enough income to avoid severe poverty. Second, pension benefits are not related to past wages because of the cap on maximum pensions. Pensioners who worked in low-paid jobs prior to retirement receive pensions that exceed 70% of their wages prior to retirement, while workers who had been in higher paid jobs prior to retirement may receive pensions barely equal to 5% of their wages. Certain groups of privileged pensioners receive even higher benefits, either because the maximum benefit cap is higher than for other workers, or does not apply to them at all. As real wages grow, therefore, more and more workers will become dissatisfied with the solidarity system.

Problems with the current pension system

Despite the favourable financial projections for the current system, maintaining the current pension system unchanged is not an option. The present solidarity system fails to meet the following conditions:

- *It must provide adequate minimum benefits – relative to the poverty level.* This requires a reasonable benefit formula in the solidarity system that protects the most vulnerable groups in society while at the same time provides acceptable benefits to the highly paid.

- *It must provide reasonable benefits relative to the contributions people pay.* People paying large contributions should receive high benefits, and those who make the same contributions should get equivalent benefits from the national pension system. If certain professions or groups need to receive better benefits, this must be financed outside the national pension system.

Despite the favourable financial projections, maintaining the current pension system unchanged is not an option, since the system fails to meet basic criteria for a good pension system.

- *The system must be fiscally sustainable for the government in the short and long term.* Although the present system is fiscally solvent, it would not solvent if reasonable benefits were paid.

- *Administrative systems should be efficient – both in terms of collecting and distributing benefits and in minimising wastage, fraud, and abuse.* Efficient administration requires modern computer and communications systems to streamline reporting, and to maintain accurate records, provide needed management information, allow efficient auditing of records and benefit calculations, and encourage voluntary compliance with contribution requirements. Although the Pension Fund has begun a program of personified reporting, there is much additional work to be done.

- *The legal framework must support a sustainable system that does not require frequent amendments.* Currently, there are many changes in components of the system being made each year, and the government lacks the financial resources to comply with existing law.

The present system's failure to meet these conditions is caused by a number of problems, which are briefly discussed below.

Retirement ages are too low

By international standards, Ukraine provides pensions at a very low age. Life expectancy at age 60 for males is 14.2 years and for females at age 55 is 22.5 years. Consequently, life expectancy following retirement is significant. Decreases in mortality, leading to longer payment periods following retirement, can be expected. Low retirement ages hurt the pen-

sion system in two ways. Pensioners receive benefit payments for a longer period of time, and they also make contributions for a shorter period of time. For women, the expected number of years of payments is only slightly shorter than the expected period of contributions. In order to improve benefits or divert contributions to a mandatory accumulation system, retirement ages must be increased. This will be a difficult change to implement because people are used to being able to receive pensions at a relatively young age. But there is no better way of increasing the proportion of people paying into the system to people receiving benefits from the system than raising the retirement age.

It will be important to explain to the public why it is necessary to increase pension ages. This means explaining the basic fact that there are more people over the age of 60 today (as a percent of the population) than there were ten years ago – and that this ratio will get progressively larger over the next 75 years. This explanation should include estimates of how much pensions can be increased today if pension ages are increased. It will also be important to introduce the increase in pension ages gradually, so that people nearing pension age are not suddenly denied pensions.

If, for example, pension ages were 60 for both men and women, old-age pension benefits would be able to be increased by 4 percent and the system would still be in the same financial condition as currently.

Too many workers receive privileged pensions

As a poor country, Ukraine cannot afford to offer privileged pensions to so many members of its workforce. Privileged retirements cause many problems. Currently, privileged pensioners have higher average pensions and begin receiving pensions at an earlier age. In 1999, there were 8.1 million old-age pensioners with an average benefit of 64.08 hryvnias, and 2.2 million privileged pensioners with an average benefit of 78.28 hryvnias. In addition, privileged pensioners are, on average, six years younger than ordinary old-age pensioners. Consequently, costs for this group are much higher than for other workers. Ordinary workers perceive the pension system as inequitable, since everyone contributes the same percent of their wages in pension contributions, but some workers get vastly better benefits. Either everyone must pay the same contribution rate and receive the same benefit, or those who receive greater benefits must pay more while they work.

This does not mean that certain professions do not need an earlier retirement age, but any increased benefits should not be financed through the national pension system. Instead, they should be paid by employers or through the state budget. Otherwise the solidarity system will be inequitable, and compliance will suffer.

Highly paid workers receive disproportionately small pensions

The current pension system gives much higher benefits as a percentage of pay to low-paid workers than to highly paid workers, even though both may have contributed the same percentage of wages throughout their working career (unless they were among the very small minority that were subject to the contribution cap).

The benefit formula for the current pension system promises a benefit of 70% of prior wages for a man with 40 years of service credits or a woman with 35 years of service credits. In reality, however, the lower-paid get the 70% benefit and, because of the maximum benefit limit, highly paid workers receive a much lower benefit as a percentage of pay. A worker earning 173.87 hryvnias per month (the average pay in 1999) gets a 43% replacement ratio (maximum benefit of 74.70 hryvnias), while a worker earning three times the average wage receives a replacement ratio of only 14.3% of pay and a worker earning 1,000 hryvnias per month (the pay cap) receives a benefit of only 7.5% of pay. Consequently, the current structure encourages the higher paid to evade. The "rate of return" on contributions made by the higher paid is extremely poor. Contributions are very high, and benefits are very low. Compliance will never improve if this is not corrected.

Reporting systems encourage fraud or misrepresentation of work experience

A related problem is that the current pension system relates benefits and contributions poorly. Not only do higher paid workers receive low relative benefits compared to the amount contributed, but also many people receive pensions while making minimal contributions. The system of workbooks is part of the problem. Employees can leave their workbooks with employers, receiving service credits, without actually contributing to the Pension Fund. Fraudulent workbooks can also be purchased cheaply. Also, students, the unemployed,

mothers caring for children, and others with no incomes (at least no registered incomes) nevertheless receive service credits.

In addition, the average monthly earnings used to calculate benefits are usually based only on the last two year's wages, so there is little incentive to contribute (or to register wages accurately) in other years. To make matters worse, employers often raise workers' wages (at least in reports to the Pension Fund) in the last two years in order to give employees eligibility for higher pensions. Consequently, there is little incentive to contribute – either because benefits are totally inequitable in relation to contributions, or because it's possible to get the same benefit without contributing.

Disability retirement is granted too easily

In most national pension systems, disability benefits are provided only to those with severe disabilities—those likely to be permanent, result in death, or demonstrably reduce workers' future incomes. Occupational disabilities are typically paid through special programs outside the pension system. Less severe forms of disability are generally paid through private insurance programs or separate state programs funded through separate contributions. Active employer participation is usually encouraged to minimise the costs of such systems.

Ukraine's solidarity pension system, by contrast, offers disability benefits to those with far less serious disabilities. In fact, many disabled retirees are able to work. About 50% of all group-3 disability pensioners are working. The disability retirement program is being used, to a large extent, as an early retirement and unemployment program. Employers who can do so have employees classified as eligible for disability benefits, thereby avoiding payment of severance and other costs associated with reducing their workforces.

In addition, the criteria for receiving benefits is often based on factors other than medical conditions. Benefits can be granted due to social or medical considerations. To make matters worse, the Pension Fund is financially responsible for disability payments but does not control the approval and review process. Consequently, there is little incentive for the Medical and Social Commission to deny disability requests, since it does not suffer the financial consequences of its decisions. The entire structure of the disability program requires review.

The Pension Fund accepts in-kind contributions and even pays benefits comprising non-cash disbursements

Some employers are permitted to make their required payments to the Pension Fund in the form of goods (known as "in-kind" contributions). Similarly, benefit payments to retirees are often made in kind. Technically, pensioners can refuse to accept in-kind payments, but in practice, their choice is often between receiving in-kind payments or no payments at all until some time in the future. Even worse is the system of bills of exchange (*veksels*), special securities issued by enterprises to pay for taxes and pension contributions that are accepted by the Pension Fund but sold at substantial discounts in financial markets. The Pension Fund receives less than it is owed, and enterprises can continue operating even though their revenues are less than their costs.

All contributions and benefit payments should be made only though proper cash payments or bank transfers. Any other system of payments allows contributors to escape from their full obligation and denies pensioners access to timely payment of the benefits due them. Pensioners should not have to sell goods at the roadside or at a market to get the money they are owed. The Pension Fund cannot act as a commodity broker, liquidating products that manufacturers cannot sell. Employers should sell their own products and contribute only cash to the Pension Fund. Anything else undermines citizen confidence in the pension system.

All working people should pay the same contribution rate if they receive the same benefit

Agricultural enterprises and the self-employed are both required to pay a flat contribution to the Treasury each year in full settlement of all tax and contribution obligations. The Treasury then allocates their payments to the various tax authorities. These payments are far less than what would be required on a payroll contribution basis. For example, there are approximately 2.5 million workers at agricultural enterprises with total wages of about 3 billion hryvnias. Payroll contributions would be about 990 million hryvnias, while the portion of the agricultural flat contribution allocated to the Pension Fund is about 430 million hryvnias. Yet these workers are still entitled to a benefit based on average monthly wages and service. This situation needs to be corrected. Ei-

ther benefits and contributions should both be based on pay, or there should be both a flat contribution and a flat benefit.

Pension Fund is not reimbursed properly

The Pension Fund makes benefit payments on behalf of many entities – national and local governments, the Chornobyl Fund, the Employment Fund, and employers – for which it is supposed to be reimbursed. Often the reimbursements received are significantly less than the amounts paid. This creates losses for the Pension Fund that lead directly to greater pension arrears. Not only should the Pension Fund be fully reimbursed, all their distribution costs should be reimbursed as well.

Paying too many social assistance benefits from the Pension Fund

The Pension Fund is primarily an insurance Fund. People pay in while they are working and expect benefits when they retire. But the government currently requires the Pension Fund to use pension contributions to pay social assistance payments to people who never worked, or who worked for such short periods of time that their pension benefits are very low. These people receive social pensions (if they have no work credits) or targeted assistance payments (if they have few years of service credits or if their wages prior to retirement were very small). The Pension Fund also pays supplements to war veterans and others. This practice undermines the integrity of the pension insurance system, and also increases benefit payments relative to contributions.

In response to these problems, the government has already made important changes. Social payments will be transferred to the State Budget between now and the end of 2001 – although how the government will pay for this increased obligation is not yet clear. Also, a personified reporting program has been established to create individual records for all workers—of wages, contributions, and service credits. These changes alone are important but not sufficient. Many of the problems with the current system are still unresolved. Consequently, the government has proposed significant additional changes in the draft Law "On mandatory state pension insurance". This draft law would modify the existing solidarity system and also establish a mandatory accumulation system.

Introducing a mandatory accumulation system

In August 2000, the Government sent to the Verkhovna Rada the draft Law "On mandatory state pension insurance". The law makes fundamental changes to the solidarity system – including raising the pension age, reforming the procedures for calculating benefits, and introducing a mandatory accumulation system. With all the changes in place, the solidarity system shows a smaller surplus due to the diversion of contributions into the mandatory accumulation system, while the ratios of contributors to beneficiaries and average pension to average wage are higher. Despite favourable projections, the mandatory accumulation system should be introduced only after the necessary preconditions are met.

Reasons for introducing a mandatory accumulation system in Ukraine

When the Government of Ukraine considered creating a mandatory accumulation system to supplement the present system, they considered five arguments – none of which, alone, is a sufficient condition for creating such a full privatised pension system, and some of which may lead to entirely the wrong approach to the design of the accumulation system:

- To smooth over time fluctuations in contribution rates and benefits that demographic changes in the ratio of contributors to pensioners would cause in a pay-as-you-go system. This argues for pre-funding, which could be done with or without creating an accumulation system.
- To privatise pension administration and/or asset management and to give to private companies some or all of the responsibility for the collection of pension revenues, investing reserves, or distributing pension benefits on the grounds that private enterprise performs these functions better than government agencies. But privatisation does not necessarily imply a system that is either mandatory or that requires full accumulation.
- To force people to set aside money during their working lives so that they will not become dependent on government benefits during their old age. This justifies a mandatory system, but not necessarily a fully funded system.

The Government of Ukraine considered five major reasons for creating a mandatory accumulation system. However, no one of reason considered by itself justifies a fully privatised mandatory accumulation system. Nevertheless, a mandatory accumulation system is one way of meeting all these goals at the same time.

- To reduce the influence of short-run political considerations. When politicians want to increase pension benefits today, they usually create long-term financing problems. This justifies linking benefits to accumulated contributions – but not necessarily for complete funding of the system.

- To create increased savings to finance investments in economic growth.

These reasons are examined in turn in the following subsections. No reason, considered by itself, justifies a fully privatised mandatory accumulation system. Nevertheless, a mandatory accumulation system is one way of meeting all these goals at the same time. Many countries have found the combination of reasons to be sufficiently compelling to create mandatory accumulation systems.[8] The World Bank, in its 1994 study of pension policy, has recommended that a mandatory accumulation system be one of the three "pillars" (together with a solidarity system to ensure basic pension benefits for the elderly and a voluntary private system) that support a healthy, balanced pension system.[9]

To smooth out fluctuations in contribution rates or in benefit levels over time

A mandatory accumulation system can help solve long-term demographic problems experienced by pay-as-you-go systems. In many countries (and Ukraine is typical of many developing countries), the ratio of pensioners to workers—what is called "the system dependency ratio"—is increasing over time. The percentage of Ukraine's population over the age of 65 is forecast to increase from 14.0% in 1997 to 16.2% in 2015, and to continue growing at an accelerated pace after that date.[10] The fertility rate – number of children born on average to each woman between the age of 15 and 40 – is declining. It

[8] Countries that have created mandatory accumulation systems include the well-publicised system in Chile, created in 1981 and recently copied (at least in part) in Argentina, Mexico, Colombia, and Peru. Accumulation systems have also been created in Poland and Hungary.

[9] See *Averting the Old Age Crisis: A World Bank Policy Research Report*, Oxford University Press, 1994

[10] See United Nations, *Human Development Report 1999*, New York, Oxford University Press, 1999, Table 16. The comparable data for Ukraine are 14.0% in 1997 and 16.2% in 2015.

was 2.3 in 1980 and has fallen to 1.3 today, although it is expected to increase to 1.8 by 2030. Consequently, there will be fewer and fewer workers to support more and more pensioners, especially from about 2020 to 2050.

One solution is to "pre-fund" a part of future benefit payments by collecting more money during times when the ratio of workers to pensioners is relatively high. The accumulated surplus (and the income it generates through investments) pays benefits in the future as the ratio of workers to pensioners falls.

The alternatives to such pre-funding are either to raise the pension age so that the ratio of workers to pensioners does not decline as quickly, to reduce pension benefits as their numbers increase so that the burden on the shrinking workforce is reduced, or to raise contribution rates from workers.

Ukraine is seriously considering raising the pension age. This is the approach used in almost all developed countries. The United States, for example, also faces a decline in the ratio of workers to pensioners and has begun raising the pension age from 65 to 67 (for both men and women) in small increments. Ukraine is not in a position to further reduce its already low pension benefits or to raise its already very high contribution rate. Therefore, raising the pension age in Ukraine will improve the financial situation, but it will not provide enough money to allow for any significant increase in benefits.

There are two reasonable sources for a rational "pre-funding" program:

1. Restructuring the solidarity system to increase compliance rates among contributors, raise the efficiency of system administration, eliminate fraud in benefit calculations, raise retirement ages, and eliminate expensive privileges; or
2. Divert into the "pre-funding program" one-time fiscal revenues from programs such as the privatisation of state assets, natural resource usage taxes, or some other temporary source of increased general revenues to the state budget.

Borrowing to pay for the new system makes no sense. If the government borrows to make the additional contributions today, no pre-funding has really occurred. This is clear when one views the problems of the government in the future. The government borrows today by issuing securities and invests

the money in the pre-funding program, it will face two groups of people wanting the money that has been accumulated: the people who loaned the government the money will want to be repaid, and pensioners will want to receive their pension benefits from the new accumulation system. The government will either have to say no to the pensioners and pay them from the solidarity system, or it will have to borrow even more money to repay the original bondholders.

Another pitfall of "pre-funding" is investing all reserves in state securities. Unfortunately, if reserve funds are simply invested in state securities, no real pre-funding has occurred. The United States social security system lends reserves to the government by purchasing special state securities, earning a lower income than it could receive if it engaged in wider investments. The social security system is simply being used to lend money to the government at low rates. To earn higher rates of return, reserves should be invested by private asset managers where they can earn more investment income for future beneficiaries than is earned by investing in government securities – and where investment decisions are not subject to influence by the government or the legislature.

It is important to note that it is actually possible to "pre-fund" future benefit payments without creating a mandatory accumulation system. A mandatory accumulation system is simply one way to do it. Reserves could simply be accumulated in the existing solidarity system and invested by the Treasury or some other government agency. Alternatively, private asset managers could invest reserves without those accumulations being allocated to individual accounts.

However, the success of pre-funding depends on investing pre-funded reserves efficiently to ensure funds are properly protected from raids by the government or by the Parliament. Both typically view any funds set aside for the future as an attractive resource to distribute to voters today. A mandatory accumulation system is, however, a good way of putting the assets out of the reach of government officials and of Parliament, by giving individuals property rights over the money invested. This means the reserves are more likely to be invested properly and to be available when they are needed.

Privatising pension administration and/or asset management

The second reason for considering an accumulation pension system is to transfer the primary responsibility for administer-

ing the collection of contributions, the investment of proceeds, or the distribution of pension benefits from the government to the private sector. Under the state solidarity system, the government monopolises all these functions. The growing worldwide volume of privatisation of activities that were formerly government monopolies – from telecommunications companies to water suppliers – attests to the fact that many governments are realising that there are operations the private sector performs better than the government. By creating competition among private companies to provide pension-related services, taking advantage of the private sector's profit motive, and utilising efficient private capital markets to invest system reserves, overall costs will decrease and the overall efficiency and fairness of the pension system will increase because this government service is now "privatised". This is no different from deciding to privatise any other industry that was previously controlled by the government.

Note that it is possible to privatise some functions of the private pension system without privatising everything. For example, in Bolivia, the government retains responsibility for collecting contributions, distributing benefits, and record keeping. However, the asset management is privatised through a tender process. In Poland, contributions are collected by the government and then remitted to private pension funds. Asset management and benefit payment functions are performed by the private sector. For its private pension funds, Kazakhstan follows the Polish model. The government, however, provides all services to people who select the state's accumulation fund.

Establishing a mandatory accumulation system reduces the government's role in the economy. It allows citizens to choose how, and with whom, they wish to save their money for retirement. Individual citizens – not government bureaucrats – are responsible for taking care of their own retirement savings. The government is responsible only for supplementing the incomes of people who have not saved enough – because of prolonged unemployment, sickness, or other problems in the labour market. The government is also responsible for regulating the private pension industry to protect participants' rights. Government is no longer managing a huge social insurance program. It is primarily the provider of a much smaller social welfare program. Its role has changed from primary provider to regulator.

Of course, the debate over whether to privatise the pension system becomes purely theoretical if the country lacks the

private capital markets, investment opportunities, and institutions to support a private pension system. This was, and is, the position of Kazakhstan and Ukraine. Responsibility can be transferred to the private sector only if the private sector exists, and if there is good reason to believe it can perform these roles better than government agencies could. Otherwise, when the new and unsupported private pension system inevitably fails, the government will be forced to "re-nationalise" the pension system at great financial expense. The government will be far worse off than it was before reform, because it will have all its old responsibilities back, plus the enormous cost of repaying the losses incurred in the failed privatisation. Ukraine cannot justify the creation of a mandatory accumulation system as the privatisation of the pension system because Ukraine lacks most of the building blocks of a private capital market.[11]

Forcing people to set aside money for their old age

All governments provide assistance for poor people. This can create a problem by discouraging people from looking after themselves. If some people save money during their working lives and receive pensions from the incomes from their savings, they will not need – nor receive – any social assistance from the government. Other people, who spend all they earn while they are working, will need social assistance when they are old.

By creating a mandatory accumulation system, therefore, the government can force citizens to save for their own retirement. This is a necessary counterbalance to the incentive toward irresponsible behaviour that the government social assistance system provides. If the government were simply to reduce the level of pension benefits from the solidarity system without introducing a mandatory accumulation system, many more elderly people would need to be provided with social assistance. The government would simply switch responsibility for financing social protection from its old-age pension system to its social assistance system.

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[11] Kazakhstan was in the same position – actually, in a somewhat more favourable position than is Ukraine today. But it still lacked trustworthy financial institutions. Therefore, after it started privatisation, it was forced to re-nationalise through the State Accumulation Fund. Consequently, their privatisation was virtual, not real.

Western countries do not face such an acute problem in this regard as does Ukraine. It is possible for government pension programs to provide much lower pension benefit levels relative to average incomes than in Ukraine. The United States Social Security system, for example, provides an average benefit to retirees of only 35% of average income – below the 38% replacement rate in Ukraine today. But this low relative benefit level is about $800 per month – far above the $12 per month in Ukraine. In addition, most of those retiring in the US have substantial additional assets at retirement, primarily due to equity accumulated in private property and the ability to save safely in banks and other financial institutions, and because the poverty level is a much lower percentage of the average wage than in Ukraine. Few of the elderly in the US are poor and, therefore, there is no strong argument for forcing them to save more through a mandatory accumulation system. In Ukraine, however, a much higher share of the elderly will be poor unless required by law to save during their working lives. Consequently, there is a much stronger argument for a mandatory accumulation pension program in Ukraine than in the United States or in other Western countries.

Depoliticise pension policy

If the pension system is privatised, people will receive old-age pensions in an amount directly and transparently linked to what they contributed into the private pension funds during their working lives. Politicians would no be able longer promise to raise pensions today in exchange for votes – storing up fiscal problems for the future – because they would no longer control the pension system. This issue was vividly illustrated during the last Ukrainian Presidential election campaign, where just prior to the elections, some back wages and pensions were paid, the minimum pension benefit was increased, and one billion hryvnias in emissions were issued by the National Bank of Ukraine.

Of course, none of these reasons necessarily justifies the creation of a mandatory accumulation system. Each goal can be met without creating a mandatory accumulation system. Privatisation and depoliticisation, for example, can be achieved by simply terminating the state solidarity system. Protecting the state from excessive welfare payments in the future can be achieved by maintaining the current solidarity system. And stabilising the balance between contributions and expenditures is achieved through pre-funding.

Increasing the supply of money to investors

Proponents of mandatory accumulation systems often make other arguments in favour of their introduction. They point out, for example, that the pool of savings available to finance economic development will be increased. But this is no justification for creating a mandatory system. Pension funds are created for pension beneficiaries – not for would-be investors. It is wrong to think that the pension system has a direct impact on promotion of savings and economic growth. Numerous surveys have not proved the hypothesis that a pension system increases domestic savings. To increase domestic savings, Ukraine needs major reforms in its laws "On the taxation of physical persons" and "On the taxation of legal entities", and—most important—safe and stable financial institutions. To force people to save before establishing safe financial institutions is tantamount to stealing from working people.

Contributions to pension accounts are, after all, only one way to save. Other ways include depreciation allowances for businesses, private savings of households, retaining profits of enterprises, and surpluses in the State Budget or in social protection funds. Budget or fund deficits reduce gross savings.[12]

A mandatory accumulation system creates a sudden increase in the supply of savings. Some policymakers argue that Ukraine is so desperate for investment funds that it can easily invest this increase. Certainly, many people would be willing to invest other people's money in various projects, but few of these investments would ever yield any returns for the unfortunate pensioners. Investments must not be made on the basis of need, but on the basis of future returns – either repayment, if the money is offered as a loan, or dividends, if the money is invested through the stock market. Forced savings do not stimulate economic growth, and may even lead to evasion – especially for low-paid workers who may not have any discretionary income, and may need to choose between retirement savings and food or heat.

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[12] In Chile, for example, pension reform increased savings, but only because the government cut expenditures and money was used to finance different programs. This directly increased savings because the surplus of revenues to the budget over budget expenditure is a part of national savings. Savings in Chile began to grow in the middle of the 1980s, but only after a great economic upheaval.

In fact, creating a pool of assets with no safe projects to invest in, and with no accepted procedures for making investments, creates many more problems than it solves. If pension assets are invested in government securities, rates of return may be so low that working people will be bitterly disappointed when they learn how small the pension is that they receive through the new pension system. The availability of a "captive" lender encourages the government to borrow money without proper consideration. If pension assets are invested in risky private projects, pensioners will also suffer losses. Today, there are simply not enough investment opportunities in Ukraine in which working people's future pensions can be entrusted. But politicians resist the idea of allowing asset managers to invest through international capital markets. Too many government officials want to use pension assets to invest in their own favourite projects.

Profile of the new law

In August 2000, the Government sent the Law "On mandatory state pension insurance" to the Verkhovna Rada. The new law makes some fundamental changes to the solidarity system – including raising the pension age, reforming the procedures for calculating benefits, and introducing a mandatory accumulation system.

In August 2000, the Government sent the draft Law "On mandatory state pension insurance" to the Verkhovna Rada. The new law makes some fundamental changes to the solidarity system – including raising the pension age, reforming the procedures for calculating benefits, and introducing a mandatory accumulation system.

The proposed changes in the draft law include a number of items that will either increase revenues to the system or will reduce expenditures. These changes allow for significant increases in benefits – thereby meeting the government's express goal of re-establishing the link between wages and service credits, and benefits.

The following proposed measures will have an impact on revenues and expenditures of the system:

- The statutory pension age will be raised to 65 for males and 60 for females. Pension ages will increase by 3 months in each 6-month period until they reach the targeted ages. Early retirement with reduced pension benefits will be permitted at the current retirement ages. This has the largest financial impact of any of the revenue enhancement/expenditure reduction measures.
- Pension payments to privileged pensioners by the Pension Fund of Ukraine will be eliminated over time. Employers will be required to finance privileged pensions by making contributions to corporate or occupational pension schemes. Eventually, the balances in these funds will be

sufficient to pay the privileged portion of the pension benefits.

- The period used to calculate average monthly earnings at retirement will be increased to reach lifetime career wages by about 2035. Past wages are indexed based on national average wages in the corresponding years. Personified records will be used, to the extent possible, in maintaining records and making these calculations. This will allow some cost savings, because it will encourage employers and workers to make contributions based on all pay in all years, and will also discourage the practice of artificially increasing wages just prior to retirement.

- For the most part, service credits will be granted only for the years in which contributions are actually paid (a change made possible by the introduction of personified reporting). This should encourage better compliance in contribution payments – although it is difficult to predict how much additional contributions it will attract.

- The minimum pension benefit is eliminated and payments to those with low pension benefits will be financed from the state budget. This will primarily affect disability, survivor, and social pensioners. Financing social pensions from the state budget has already been included in our projections, so this will have no impact. Eliminating the minimum benefit will have a minor impact on disability and survivor benefit payment projections.

- The accrual rate per year of service will be reduced from the present level of 2.2% per year for men (for the first 25 years of service, 1% thereafter) and 2.75% per year of service for women (for the first 20 years, 1% thereafter) to 0.8% for all years of service. The accrual percentage earned as of the date the law is amended will be preserved.

- Disability retirement benefits will now be a percentage of the projected retirement benefit, rather than a percent of wages. This will slightly reduce the overall level of disability benefits.

- Set the wage cap on wages subject to contributions and used to calculate benefits equal to four times the average wage but not less than the current 1,000-hryvnia limit. This will effectively freeze the wage limit for a number of years, and then it will begin to increase each year.

The measures that will increase pension benefits over time are:

- Index pension benefits at 20% of the rate of growth of wages, in addition to inflation indexing already included in the law.
- Increase the maximum pension benefit each year by the increase in nominal wages plus 2% for each of the first 10 years, and 4% thereafter until the maximum pension benefit has no impact on benefit calculations.
- Beginning after certain economic and administrative preconditions have been met, a portion of payroll contributions will be diverted from the solidarity system to a new mandatory accumulation system based on individual accounts. The contribution will be no less than 2% and no more than 7% of wages. An actuarial certification of the affordable level of mandatory system contributions is required to allow the diversion of money to the new system.

Fiscal analysis of the reformed solidarity system[13]

Contributors and beneficiaries

Fiscal projections of the financial impacts of the draft law show that the solidarity system will be in balance after all the changes are made. The system shows a smaller surplus, due to the diversion of contributions into the mandatory accumulation system, while the ratios of contributors to beneficiaries and average pension to average wage are higher.

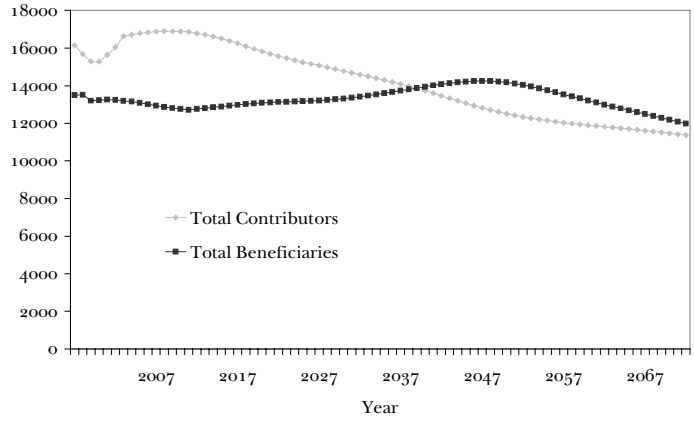
Analysis of the reformed solidarity system is far more complex than that of the current system. Of course, reforming the pension system has no impact on the overall population projections for Ukraine. However, it does significantly change the expected number of contributors and beneficiaries. The increased retirement age both increases the size of the labour force and the number of contributors, and reduces the number of beneficiaries, thereby improving the financial conditions of the Pension Fund, as shown in the chart below.

This is a very different picture than that provided by the current law. There are more contributors and fewer beneficiaries. The number of contributors does not become smaller than the number of beneficiaries until 2040, rather than in 2032 as under the current law. And these results are based on the assumption that men, on average, retire at age 63 and women at age 58. Were all workers to wait until ages 65 and 60 (males and females, respectively), the results would be even more favourable.

[13] While making these projections, we assumed the same economic and demographic scenarios as previously.

Chart 9. Contributors and beneficiaries

thousands



The table below shows a comparison between the current and draft laws in selected years.

Table 5. Comparison of contributors, beneficiaries and dependency ratios

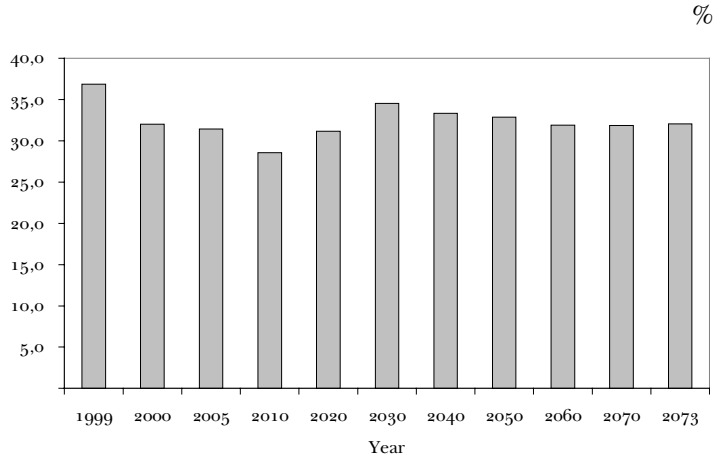
	1999	2010	2040	2070
Contributors, current law (millions)	15,685.5	16,456.4	13,305.8	11,096.3
Contributors, draft law (millions)	15,685.5	16,891.2	13,863.2	11,517.6
Beneficiaries, current law (millions)	13,518.3	13,524.2	14,779.4	12,960.8
Beneficiaries, draft law (millions)	13,518.3	12,811.4	13,870.9	12,290.8
Dependency ratio, current law	86.2%	82.2%	111.1%	116.8%
Dependency ratio, draft law	86.2%	75.8%	100.1%	106.7%

The change in retirement age also changes the distribution of beneficiaries by type of retirement. Following the reforms, there will be a lesser proportion of old-age retirees and a greater proportion of disabled retirees. This will put even more pressure on the government to significantly reform the entire disability retirement system.

Replacement ratios

Another direct impact of the draft law is to increase replacement ratios. This will result from indexing for inflation as well as 20% real wage growth. It is also caused by improvements in benefits for the higher paid by phasing out the maximum benefit cap over time. These replacement rates assume men will wait until age 65 and women wait until age 60 to begin receiving benefits. It also includes the replacement ratios from the mandatory accumulation account, assuming an annuity is purchased that is indexed to 100% of inflation plus 20% of the increase in real wages. Of course, if workers voluntarily choose to retire earlier with reduced benefits, replacement ratios will be smaller.

Chart 10. Replacement ratios



As can be seen, the combination of the solidarity system and mandatory accumulation system under the draft law provides much higher replacement ratios than the current system in all years. Replacement ratios are much higher than the current law from 2005 through 2040, and remain modestly higher throughout the entire analysis period.

Pension Fund surplus and reserves

The financial picture under the reformed pension system is favourable. This is primarily due to two factors: the first is the fact that pension indexing was less than inflation in 1999, and will be much less than inflation in 2000. The second reason is the favourable economic outlook for Ukraine, especially during the next 10 years. High rates of real wage growth spur

sharp increases in contributions, producing favourable financial results for the Pension Fund. The table below shows this pattern.

Table 6. Pension Fund balance and reserves under the draft law

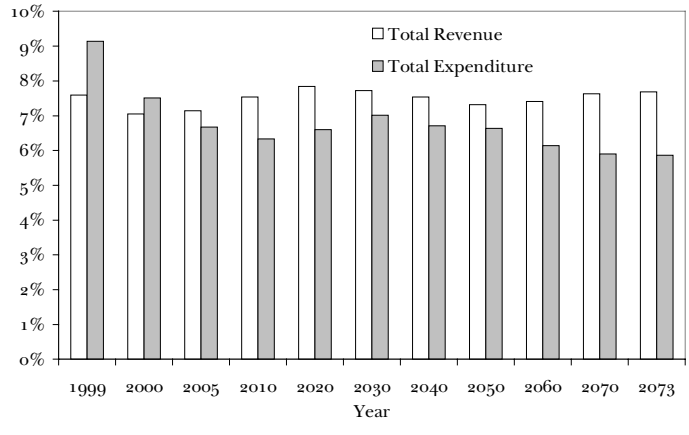
millions hryvnias

Year	1999	2000	2005	2010	2020	2030	2040	2050	2060	2070	2073
Surplus/ (Deficit)	(1.9)	(0.7)	1.6	6.4	16.5	20.3	51.4	77.2	290.2	647.8	816.4
Reserves			3.1	22.5	174.9	430.7	959.1	1,986.1	4,867.7	11,090.9	14,457.1

The chart below shows another picture of the reformed pension system. It shows Pension Fund of Ukraine revenues and expenditures as a percentage of GDP.

Chart 11. Pension Fund revenues and expenditures

% of GDP



However, the new pension system will require very careful financial management. The reserves must be invested to earn the highest possible rate of return while minimising risks. This will likely require a policy of worldwide investment, similar to the investments for the mandatory accumulation system. The illustrations above assume reserves earn a rate of return equal to inflation plus 3%. If the rate of return is less, the financial outlook is not nearly as favourable.

Alternative feasible solidarity system scenarios

During the debate over the draft laws, there will be many attempts to amend major provisions. The following table shows financially viable scenarios (that is, the solidarity system will experience neither a surplus nor a deficit overall), assuming that the pension ages are amended. However, if pension ages are left at the present level, then either the accrual rate, the contribution rate to the mandatory accumulation system, or the wage indexing will have to be changed. Each option shows the values that these important parameters will have to be set at to keep the system in financial balance.

Table 7. Financially viable pension reform scenarios

	Pension ages (men/women)	Contribution rate to mandatory accumulation system	Accrual rate per year of service	Wage indexing
CURRENT LAW "ON PENSIONS"				
	60/55	0%	Men: 2.2% for 25 and 1% thereafter. Women: 2.75% for 20 years and 1% thereafter	None in law (although actions by the GOU and Verkhovna Rada have allowed benefits to increase)
DRAFT LAW "ON MANDATORY STATE PENSION INSURANCE", AUGUST VERSION				
	65/60 (with early pensions permitted)	7.0% beginning no sooner than 2003. Certain economic and administrative preconditions must be met first	Same as current law before 2001; 0.8% per year starting 2001. Maximum benefit phased-out	20%
FEASIBLE OPTIONS				
Option 1	65/60	9%	0.8%	0%
Option 2	65/60	5%	1.0%	20%
Option 3	65/60	7%	1.0%	0%
Option 4	65/60	5%	0.8%	50%
Option 5	65/60	4%	1.0%	50%

Preconditions for creating the mandatory accumulation system

There are strong arguments in favour of delaying the introduction of a mandatory accumulation system until four preconditions are met: a strong economy, completion of personification, proper operation of regulatory systems for the private pension system, public awareness of the new system.

There are strong arguments in favour of delaying the introduction of a mandatory accumulation system until four conditions are met: 1) a strong economy; 2) completion of the program of personifying reporting and record-keeping by the Pension Fund; 3) regulatory systems for the private pension system are operating properly; and 4) the public has been fully informed about all aspects of the mandatory accumulation system.

A strong economy

The first precondition is that economic conditions in Ukraine should be strong enough to generate sufficient revenues to the Pension Fund to allow some revenues to be diverted to the mandatory accumulation system while permitting the Pension Fund to continue paying in full for solidarity benefits. Only a limited amount of contributions paid into the mandatory accumulation system or for continued solidarity pension benefits should be financed either from general revenues of the State Budget, or from the issuance of government debt, or from privatisation proceeds.

Kazakhstan attempted to start a mandatory accumulation system by increasing the deficit in the existing solidarity system and its state budget. The government found it could not finance the necessary increase in government borrowing through ordinary means, so it forced the private pension funds to loan it money at below market interest rates. This undermined the fundamental nature of the pension reform, since the system's primary focus became loaning money to the government at the lowest possible cost rather than maximising retirement benefits to workers.

The financial ability of the pension system to divert contributions from the solidarity system to a mandatory accumulation system should be ascertained through actuarial projections by a trained and certified actuary using a properly designed and tested model of the Ukrainian pension system. The Government of Ukraine, therefore, should make it a priority to fully institute the Office of the Actuary, including training of actuaries and development of actuarial models that comply with international actuarial standards.

Completion of personification

The second condition is that the Pension Fund of Ukraine should have completed the design and implementation of a fully personified system of reporting and maintaining records for all working Ukrainians. Personification is a vital precondition. Both Kazakhstan and Poland have encountered major administrative problems from trying to introduce a mandatory accumulation system before they had completed the personification of the reporting and records of their pension systems. If the record-keeping system is not functioning properly, then there is no way to be sure that contributions are properly allocated between the solidarity and accumulation systems, and among contributors. There is also no way to properly balance cash and data records. The usual result is chaos in the pension system. The record-keeping systems must function properly before contributions are permitted to begin. Problems in Kazakhstan and Poland amply illustrate the risks of beginning too soon.

Proper regulatory oversight of the private pension system

The third condition is that the legal and administrative infrastructure for regulating the management and custodianship of pension assets has been designed, tested, and is functioning properly and effectively. The sudden surge of funds that will have to be invested demands that regulatory systems are already working. To try and set them up at the same time as the new accumulation system would guarantee a large financial catastrophe. Compliance, enforcement, transparency, and disclosure are critical for the success of the mandatory accumulation system. Without these, it is almost certain that contributions will be lost, illegal investments will be made, marketing and advertising practices will be misleading, and participants' rights will be violated.

For this reason, the mandatory accumulation system should not be introduced until several years after the system of non-state private pension funds is operating. Non-state pension systems will benefit relatively small numbers of people – most of whom will be high wage earners. Therefore, the consequences of any problems encountered during implementation will be smaller.

Public awareness

The fourth precondition is that the system should not be introduced until the public understands clearly what the mandatory accumulation system is, and what are its risks and benefits. After all, the introduction of the mandatory accumulation system necessarily involves the transfer of risks from the government to future pensioners. If financial markets collapse, then people retiring at the time of the collapse might find that their accumulated balances are smaller than those of their colleagues who retired a few months or a few years earlier.

The public needs to understand several aspects of the mandatory accumulation before it is implemented. For example, women will receive smaller annuity benefits when they retire than men, even if both have accumulated the same amount in their individual accounts. This is because women live longer after retirement than men. Today, a Ukrainian woman reaching pension age (55 years) can expect to live an additional 22.2 years, a man only 14 years after reaching retirement age of 60. An annuity will offer the women smaller monthly benefits, because those benefits will have to be paid for a longer time. In addition, women are likely to have accumulated less money, because they will have worked for fewer years and will have earned lower wages. A mandatory accumulation system, therefore, will provide lower pensions for women.

Some countries – Croatia, for example – have tried to overcome this by requiring insurance companies to offer the same monthly annuity payments for men and women if both have accumulated the same balance in their individual accounts. Another way of overcoming this problem is for the government to make payments into women's accounts during the periods when they are not earning but raising young children.

As life expectancy grows in Ukraine, the monthly payments received by people retiring, expressed as a percent of the amount accumulated in account balances, will decline – the result of having to continue the payments for a longer period of time. This decline will be lower if pension age is increasing at the same time that life expectancy is increasing. Again, people have to understand this if they are not to feel betrayed by the system when they retire in the future and receive smaller benefits than they had anticipated.

Finally, the public needs to understand that the administrative expenses for the accumulated system are higher than for the state solidarity system. In Chile, for example, average administrative expenses per client in Chile in the 1990s constituted 2.2% of wages from which contributions were calculated, or about 22% of contributions. Comparable levels of administrative expenses are found in other private pension systems as well.

Risks and benefits of the new system

From the preceding discussions, we may conclude that a properly designed mandatory accumulation system offers several benefits to future pensioners and to the government. But these benefits are not achieved without costs. The Government of Ukraine and the public as a whole must be aware of not only the benefits of the mandatory accumulation system but also about its potential risks. The risks and benefits of a mandatory accumulation system are summarised in the following table.

Table 8. Risks and benefits of a mandatory accumulation system in Ukraine

Benefits	Risks
1. Participants have their own pension accounts (something like bank savings accounts) that protect them from undue interference from the Government.	1. If contributions yield a small amount of interest, net of expenses, participants may get a smaller pension than from a solidarity pension system. Participants may lose all their money in case of wrong investment and the failure of the regulatory system to operate effectively.
2. As the amount of the future pension depends on the amount of contributions, participants are encouraged to pay them or to make their employer pay them – this will be a factor encouraging firms to emerge from the "shadow" economy into the formal economy.	2. As the amount of the future pension depends on the amount of contributions, low-income participants will receive smaller benefits than those with high incomes, because they will have accumulated less in their funds. Hence, the government will need to provide them additional assistance.
3. Participants who earn higher wages will make larger contributions and will receive larger payments – a stronger incentive to work and earn more than under the solidarity system.	3. The mandatory accumulation system has no mechanism to provide pension benefits to the elderly who are poor, or to shift benefits from high income participants to low income participants, as pensions depend wholly on contributions paid by each individual.

Benefits	Risks
4. If asset investments are under private management, the returns earned by the funds are likely to be higher than returns earned if the government invested the accumulated balances – providing asset managers are properly regulated and selected on competitive, performance-based tenders, and provided that the government does not artificially restrict investment to the domestic market.	4. The working disabled, chronically unemployed, and women raising children cannot save money for decent benefits prior to pension age.
5. Switching from a pay-as-you go pension system to an accumulation system will increase the availability of investment capital in Ukraine.	5. If the government cannot afford the transition cost, they may force the private pension funds to loan them money at below market interest rates. This will use up available credits, and will not generate economic growth.
6. Pension age is not a structural element of the system. Participants can establish a desired benefit amount and pension age on their own.	

Conclusions

Ukraine has embarked on an extensive reform of its pension system. The projections in this paper are intended to help policymakers as they evaluate the options before them. The decisions they face are not easy: the basic demographic trends in Ukraine will continue to raise the number of pensioners relative to the number of contributors to the pension system.

Nevertheless, there are some opportunities to improve the situation for Ukrainian pensioners. The present solidarity system can continue to support pensioners without plunging into a large deficit. Once economic growth begins, benefits can eventually be lifted above their present low levels. In the meantime, however, Ukraine will have to deal with the problem of poverty among the elderly by expanding targeted social assistance, which will provide income supplements to pensioners living in low-income families. These projections have assumed that there is no net shift of enterprises and employees from the shadow economy to the official economy. If the new program of personification and other necessary improvements in tax and contribution collections are made, then the financial situation of the solidarity system could improve considerably – allowing additional improvements in benefits, reductions in the overall contribution rate, and increases in the contributions to the mandatory accumulation system.

As the government has acknowledged in the latest draft Law, "On mandatory state pension insurance", the best way to provide pensioners with better benefits, and benefits that provide a greater reward for those who have worked for many years in well-paid jobs, is by raising the pension age. The elimination of privileged pensions will also provide the Pension Fund with resources to provide better and more equitable benefits.

The creation of a mandatory accumulation system will provide people with the opportunity to save money for their own retirement. But there are many problems in implementing a mandatory accumulation system to ensure that these savings are protected and earn a reasonable rate of return. As proposed in the current draft law, the new accumulation system will be largely funded from surpluses in the solidarity system, rather than through borrowing or use of privatisation pro-

ceeds. The success of the new pension program will also depend on the government's ability to create the necessary administrative systems to allow accurate record-keeping of the individual accounts, proper auditing to prevent mismanagement, and the creation of proper regulatory systems. As the experience of many countries shows all too clearly, these are not easy tasks. Premature implementation of the mandatory accumulation system could create a financial catastrophe that would have serious implications for the government's overall financial stability.

Appendix A. Pension systems throughout the world

Almost all nations have developed pension systems, and in all these pension systems the government has played crucial roles. But systems differ widely, reflecting differences in prevailing economic conditions, political structures, national preferences for allocating responsibilities among the public and private sectors, and accidents of history. Therefore no single approach to pension reform can be adopted universally. Table A-1 shows the variety of approaches to pension policy adopted in 173 countries that were surveyed by the US Social Security Administration – the agency that administers the US solidarity pension system.

Table A-1. Types of pension systems throughout the world

Characteristics of financing and benefits	Number of pension systems
System basing benefits on previous contributions and earnings	139
System of mandatory state accumulation	18
System of mandatory individual accumulation	12
System without contributions, in which benefits are distributed based on need	27
Universal system without contributions	5
System of stable benefits based on contributions	20
Total:	**221**

Note: six out of 173 surveyed countries offered no government-organised pension systems.

Source: Social Security Programs Through the World-1997. U.S. Social Security Administration, 1997, Research Report N65.

In the 173 countries there were a total of 221 pension systems, although six countries offered no government-organised pension systems at all. All but five pension systems linked benefits to past contributions, and 30 systems were based on accumulation of savings – 12 by individuals and 18 by the state. 139 pension systems were similar to Ukraine's – solidarity systems in which benefits are based on past contributions and service records.

Appendix B. Key economic and pension system indicators for Ukraine (1991-1999)

	1991	1992	1993	1994	1995	1996	1997	1998	1999
Real GDP[1]	- 8.7	-9.9	-14.2	-23.0	-12.2	-10.0	-3.0	-1.9	-0.4
Real GDP (1990=100)	91.3	82.3	70.6	54.4	47.7	42.9	41.6	40.8	40.8
Industrial output[1]	-4.8	-6.4	-8.0	-27.3	-11.5	-5.1	-0.3	-1.0	4.3
Inflation[1]	290	2,000	10,155	401	182	39.7	10.1	20.0	19.0
Balance of state budget (in % to GDP)	—	-12.2	-6.5	-10.5	-6.8	-4.9	-6.8	-2.1	-1.5
Employment[1]	-1.6	-4.0	-2.5	-5.1	7.7	-2.1	-2.7	-1.1	-0.7
Unemployment (%)[2]									
registered	—	0.3	0.3	0.4	0.5	1.3	2.3	3.7	4.3
calculated by ILO methods	—	—	—	—	5.6	7.6	8.9	11.3	11.9
Real wages[1]	6.1	-38.6	-51.5	-14.6	9.2	-2.5	-0.4	-2.8	-5.7
Real wages (1990=100)	106.1	65.1	31.6	27.0	29.5	28.7	28.6	27.8	26.2
Exchange rate of hryvnia to US dollar (year-end)[4]	—	638	12,610	104,200	179,400	1.893	1.899	3.427	5.216
Discount rate, end of the year	N/A.	76	221.1	201.7	107.1	77	49.1	54.5	53.4
Capitalised value of all traded shares as % of GDP	—	—	—	—	—	1.0	1.5	1.5	1.7
Population, millions	51.9	52.1	52.2	52.1	51.7	51.1	50.5	50.1	49.9
Number of retirees, millions	13.6	14.2	14.5	14.5	14.5	14.5	14.5	14.4	14.5
Retirees (as % of the population)	26.2	27.3	27.8	27.8	28.0	28.4	28.7	28.7	—
Pension expenditures (in % to GDP)	9.5	7.9	8.3	7.4	7.9	9.3	10.3	9.5	—
Ratio of contributors to retirees [5]	1.69	1.55	1.46	1.37	1.31	1.23	1.15	1.15	1.10
Real pension (1990=100)	79.6	68.5	23.1	15.9	18.4	17.2	15.7	15.3	15.2
Replacement ratio (ratio of the average benefits to the average wages)	36.1	35.3	68.4	45.1	36.1	36.6	38.9	36.1	39.1

Notes:
1.Changes y-o-y (in %)
2.Percentage of economically active (i.e., working) population
3.According to annual sample labour surveys in October 1995-1998 and quarterly surveys first done in 1999
4.In 1992–95 – in karbovanets, from 1996 – in hryvnias
5.Number of contributors is the ratio of the payroll fund to the average wage in economy

Source: State Committee for Statistics, National Bank of Ukraine, author's estimates.

Appendix C. Questions and answers about Ukraine's current pension system[14]

1. What types of pension benefits are there?

Labour and social pensions are available. There are four types of labour pensions:

- Old-age pensions: This includes both standard and early old-age pensions.
- Disability pensions: Different types of pensions are available, depending on the severity of the disability.
- Survivor pensions: These are payable to children, parents, and others who lose support as a result of the death of a principal wage earner.
- Long-service pensions: These are special pensions for those involved in industries requiring early retirement. Most positions are in the transportation industry.

Social pensions: This is payable to those with insufficient service to quality for other pensions. The social pension is also the minimum pension payable to other categories of pensioners (Article 2).

2. When do pension payments begin?

Old-age pensions begin from the day you reach your retirement age. Disability pensions are paid from the day the medical and social expert agency issues a decision confirming your eligibility. Survivor pensions are paid from the day your right to receive the pension was granted (Article 83).

3. What are the eligibility conditions for a standard old-age pension?

To receive an old age pension, a male must have attained age 60 and have at least 25 years of service, and a female must have attained age 55 and have at least 20 years of service. Those with less than the required amount of service receive a short-service old-age pension (Articles 12 and 20).

4. What is the pension amount for standard old-age retirement?

For a man who has attained age 60 and has 25 years of service or a woman who has attained age 55 with 20 years of service, the standard pension is 55% of average monthly wages. For each additional year of service, the pension is increased by 1% of average monthly wages, to a maximum of 75%. The pension calculated under this formula is subject to both a minimum and maximum amount. It may also be increased for supplementary payments (Article 19).

5. What pension does someone with less than the standard service period receive?

The pension is prorated to reflect the lesser period of service. If a man had 15 years of service at retirement rather then the required 25 years, the benefit would be 33% of pay (55% * 15 / 25) instead of 55% (Article 20).

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[14] Based on the current law "On pensions".

6. How is average monthly wage calculated?

Average monthly wages is equal to the greater of the average pay for the 24 months immediately preceding the date the pension is calculated, or the highest 60 consecutive months at any time in the worker's career. For retirees using wages on or after January 1, 1992, pensions have been recalculated at various times using wage coefficients (Article 65).

7. How is service calculated?

Service is granted for all periods of time for which contributions were made to the Pension Fund. In addition, service credit is given for certain periods when contributions were not paid. The most common additional service credit periods are:

- military service, and service in units and agencies of state security and internal affairs (Article 56c and 56d);
- study in higher and secondary educational institutions, advanced training courses, and other types of education (Article 56e);
- periods of service while caring for certain types of disabled (Article 56g);
- certain periods of child care (Article 56h);
- occupational disability periods (end of Article 56);
- military service during periods of hostilities (Article 57);
- citizens who were unlawfully detained, imprisoned or exiled (Article 58);
- work or forced confinement during the Second World War (Article 59);
- work in hospital for lepers and plague-carriers (Article 60).

Consequently, it's possible for service to include a great deal of time for which contributions to the system were not made.

8. What is the minimum pension amount?

For anyone with the full amount of service needed for retirement, a minimum benefit is payable. The minimum rate of old-age pension is equal to the minimum consumer budget. In times of economic hardship, however, this minimum can be reduced to a rate not lower than the subsistence level. The subsistence rate was set at 118 UAH per month as of January 1, 1999. However, this rate is not used at this time to adjust pension benefits. The minimum pension benefit as of September 1, 1999 is 24.9 hryvnias. For those with less than the required amount of service, the minimum benefit is prorated, but cannot be less than 50% of the minimum old-age pension (12.45 UAH) (Articles 19 and 68).

9. What is the maximum pension amount?

The maximum pension for old-age pensioners is three times the minimum pension rate. Currently, the maximum pension for a full-service pensioner is 74.70 hryvnias.

10. Are there any supplemental pensions payable to old-age pensioners?

Yes. There are several special supplements paid to old-age pensioners. These are paid in addition to the basic pension, even for those individuals who are receiving a minimum or maximum pension.

- All non-working retirees, including short service retirees, are eligible for subsistence pecuniary aid. These individuals can receive additional payments up to a maximum of 21.10 UAH per month if their pension is less than 46 UAH per month (CMU Decree dated July 26, 1996).

- If a non-working pensioner is supporting a family member who is entitled to a survivor benefit, then an additional pension is payable for each such family member. The payment is equal to the social pension for that person, based on their category of disability. The additional pension can vary from 30% to 200% of the minimum pension per person (4.99 UAH to 33.24 UAH per person) (Articles 21 and 76).
- Single pensioners that require permanent outside medical care receive a supplement of 50% of a social pension (8.31 UAH) (Article 21).
- Individuals subjected to unlawful political repression and later rehabilitated have pensions increased by 50% of a minimum old-age pension (8.31 UAH). Members of their families who were forcibly resettled have pensions increased by 25% of a minimum old age pension (4.16 UAH) (Article 77).
- Other war veterans and civilians that served in front-line forces or participated in combat actions receive 50% of a minimum old age pension (8.31 UAH) (Article 77).
- Single non-working individuals who have reached retirement age can receive state pecuniary aid of up to 15 UAH per month if their pension is less than 52 UAH per month, and the per capita income of the household in which they live is less than 52 UAH per month (CMU Decree No. 19, dated January 9, 1996).

The effect of all these provisions taken together is that no full service pensioner receives less than 46.00 UAH (minimum pension of 24.9 UAH plus a supplement of 21.10 UAH), and many pensioners receive the maximum pension of 74.40 UAH. However, since a pensioner can be eligible for multiple supplements, it's possible to get a much higher benefit amount.

11. How long are old-age pensions paid?

Pensions are paid until the individual dies.

12. Can pensioners continue to work after retirement?

Yes. Workers are permitted to draw pensions and continue working. In this situation, the pension amount can be recalculated every two years to reflect increases in pay. For short service pensioners, increases in pension will reflect both increased pay and service (Articles 69 and 70).

13. Who is eligible for early old-age pensions?

The pension law allows certain categories of workers to retire prior to age 60 or 55, and/or with less than the required amount of service. In order to qualify for these early pensions, the worker must have a certain minimum number of years in the qualifying profession as well. Generally, these are professions that are hazardous or strenuous. For List No. 1 and List No. 2 employees, benefits begin earlier if the individual has satisfied at least half the service requirement in the profession (Article 13).

14. Who pays for the additional cost of early pensions?

Payments to List No. 1 are the responsibility of the Pension Fund. For all other early retirement pensions, enterprises and organisations must make payments to the Pension Fund sufficient to pay pensions until the individual reaches the standard retirement age. In actuality, these payments have often not been made, and the Pension Fund has had to pay these pensions from its revenues (Article 13).

15. How are benefits for early old-age pensioners calculated?

Generally, benefits are calculated in the same way as normal old-age pensions. However, there are certain differences:

- the maximum pension as a percent of pay is equal to 85% of average monthly wages for those on List No. 1, and for those listed in Article 14;
- the maximum pension is four times the minimum pension, or 99.60 UAH for those with full service on List No. 1 and for those listed in Article 14.

16. Are there supplemental pensions payable to early old-age pensioners?

Yes. The same supplements which are payable to standard old-age pensioners are also payable to early old-age retirees.

17. How do long-service pensions differ from early old-age pensions?

Long-service pensions are in a separate part of the pension law. Early old-age pensions are provided to those who work in hazardous professions or under conditions of extreme hardship. Long-service pensions, however, are given to those whose employment causes loss of professional ability or capacity for work prior to the old-age pension retirement age. Also, these pensions are paid by the Pension Fund, whereas most early old-age pensions are supposed to be paid by the employer.

18. Who is eligible for a long-service pension?

Generally, the following categories of workers are eligible for long-service pensions:

- flight and test-flight personnel;
- members of locomotive crew, and workers that organise transportation and guarantee railway and subway transport safety;
- certain truck drivers in the mining industry;
- dock mechanics in ports, seafaring personnel on fishing industry fleet;
- workers involved in field geologic surveying, prospecting, hydrology and forest engineering;
- workers involved in timber cutting;
- some theatre and show performers;
- education, health care, and social protection specialists working with pensioners and disabled;
- athletes (Articles 52, 54 and 55).

19. What benefits do long-service pensioners receive?

All categories of long-service pensioners except flight and test-flight personnel have their pensions calculated the same way as all other old-age pensioners. The minimum and maximum pension amounts are the same as well. Benefits for flight and test flight personnel are similar, except the maximum pension amount is 85% of pay, and there is no maximum pension.

20. Are there any supplemental pensions payable to long-service pensioners?

Yes. The same supplements which are payable to standard and early old-age pensioners are also payable to long-service retirees.

21. Who is eligible for a disability pension?

Anyone who suffers a complete or partial loss of health is granted a disability pension, payable regardless of whether the disability is occupational, or due to general illness. This includes those who were disabled since childhood. All disabilities are divided into 3 groups, depending on the severity of the disability (Article 23).

22. What is an occupational disability?

Disabilities because of injury are considered occupational if they occur in the following circumstances:

- while performing job duties;
- while on a business trip;
- on the way to or from work;
- on or near the place of work during normal work hours, including breaks;
- while performing official or public duties.

All other disabilities are considered to be for general illness (Article 26).

23. What are the eligibility conditions for an occupational disability pension?

Disability pensions for labour injury or occupational disease are granted regardless of length of employment. There are no age or service requirements (Articles 25 and 28).

24. What are the eligibility conditions for general illness disability pension?

The required employment period increases with age. Those who do not meet the service conditions are eligible for a prorated pension (Articles 26, 28 and 30).

25. What benefits do disability pensioners receive?

The benefit amount depends on the disability category that is assigned. Benefits are equal to a percent of average monthly wage, as follows:

- group 1 – 70%;
- group 2 – 60%;
- group 3 – 40%.

If a worker has sufficient service for an old-age pension (standard or early), then the disability pension will be equal to the old-age pension. A worker who does not have sufficient service to qualify for a general illness pension, will receive a prorated pension (Article 29).

26. Is there a special minimum disability pension?

Yes. The minimum disability pension is equal to the social pension for the disability group. The minimum pension applies to regular as well as short-service disabilities. These minimum pensions are:

- group 1 – 200% of the minimum old-age pension (33.24 UAH);
- group 2 – 100% of the minimum old-age pension (16.62 UAH);
- group 3 – 50% of the minimum old-age pension (8.31 UAH).

27. Is there a maximum disability pension?

Yes. The maximum disability pension is the same as the maximum for old-age pensions (Article 29).

28. Are there any other types of payments made to disabled pensioners?

Yes. There are supplements payable to certain types of disabled pensioners.

- Non-working disabled that support disabled family members receive one social pension for each disabled family member, based on that person's category of disability.

- Group 1 or single Group 2 disabled that either require permanent outside care or have reached retirement receive 50% of the minimum old-age pension (8.31 UAH).
- Group 3 single disabled that have reached retirement age receive 50% of the minimum old-age pension (8.31 UAH).
- Chornobyl victims receive payments and bonuses in accordance with the law "On status and social protection of victims of the Chornobyl Catastrophe" (Article 77).
- Old-age pensions to disabled veterans – the pension is increased by a minimum disability pension based on the law of Ukraine "On pension security of servicemen" (Article 77).
- Pensions for those disabled since childhood or to survivors because of serious injuries inflicted in combat operations during WWII receive 15% of a minimum old-age pension (2.49 UAH) (Article 77).
- Single individuals who are group 1 or 2 disabled, or families comprised of the above individuals can receive state pecuniary aid of up to 15 UAH per month if their pension is less than 48 UAH per month, and the per capita income of the household in which they live is less than 48 UAH per month (CMU Decree No. 19, date January 9, 1996).

It is possible to receive more than one type of supplement (Article 33).

29. When do disability pensions stop?

Disabled people who are over age 60 for men, or 55 for women, receive benefits for life. Other disability pensions are granted for as long as the individual remains disabled. Disabled individuals must go for re-examination periodically in order to continue receiving benefits. Disabled pensioners who do not go to scheduled examinations may have their benefits stopped.

30. Who is eligible for a survivor pension?

The following types of individuals are eligible for a survivor benefit:

- "disabled" family members that were supported by a deceased principal wage earner;
- children, regardless of whether the principal wage earner supported them;
- parents or spouse who loses their means of subsistence as a result of the death of the principal wage earner.

The following family members are considered "disabled":

- children, siblings, and grandchildren under age 18 (under age 23 if a student) receive 100% of minimum old-age pension (24.90 UAH);
- children, siblings, and grandchildren over age 18, if they became disabled prior to age 18 receive 100% of the minimum old-age pension (24.90 UAH);
- siblings and grandchildren if both parents are unable to work receive 100% of the minimum old-age pension (24.90 UAH);
- father, mother, spouse who is disabled receives a pension based on their disability group;
- father, mother, spouse who have attained age 60 for men or 55 for women receives either 30% or 50% of the minimum old-age pension;
- one of the following—parents, spouse, grandparents, siblings – who does not work in order to care for children, siblings or grandchildren of the deceased who are under age 8;
- grandparents if there is no one who is legally required to care for them receives either 30% or 50% of the minimum old-age pension.

Foster parents and adopted children have the same rights as parents and natural children. Stepparents who supported a deceased child for at least 5 years and stepchildren who receive no

payments from their natural parents are also eligible for survivor pensions. The survivor pension does not stop because of the remarriage of the surviving spouse (Articles 37, 40, 41 and 42).

31. What benefit do the eligible survivors receive?

The basic survivor pension for each "disabled" family member is 30% of the average monthly wage of the principal wage earner. This amount for each beneficiary cannot be less than the social pension for the corresponding category of disability. If a child loses both parents, the pension is calculated on the sum of the wage of the two parents combined. A child who loses both parents or a single mother gets a minimum pension equal to double the amount of the social pension. If the deceased died as a result of general illness and had not met the service requirements for a full disability pension, then the benefit is prorated based on actual period of employment. However, the pension for each disabled family member is still equal to at least the amount of the social pension for the corresponding category of disability. The full benefit amount is normally paid as a lump sum to the family of the deceased. However, individual family members can apply to have their portion paid separately.

32. How long are survivor benefits paid?

Benefits are paid for as long as a person is considered disabled. The total benefit amount can change as the number of eligible family members changes. Benefits are paid for life to family members that attain age 60 for men or age 55 for women.

33. Are there any funeral benefits?

Yes. When a pensioner dies, the family, or the person who organised the funeral is entitled to funeral assistance equal to two months of pension payments (Article 91).

34. Who is eligible for a social pension?

Social pensions are granted to individuals who are not eligible for a labour pension. This includes the following categories of individuals:

- disabled of all groups;
- individuals who attain age 60 for men or 55 for women;
- children who lose a principal wage earner;
- disabled minors under age 16.

35. What is the amount of social pensions?

The amount paid varies by category, as shown below:

- 30% of the prior minimum old-age pension (4.99 UAH) – individuals who reached retirement age (60 or 55) and were not eligible for a labour pension without a valid reason;
- 50% of the prior minimum old-age pension (8.31 UAH) – individuals who reached retirement age (60 or 55) and were not eligible for a labour pension because of a valid reason;
- 50% of the minimum old-age pension (12.45 UAH) – group 3 disabled;
- 100% of minimum old-age pension (24.90 UAH):
  - group 2 disabled;
  - disabled minors under age 16;
  - children, brothers, sisters, and grandchildren under age 18;
  - caretaker looking after children under age 8 due to the death of a principal wage earner.
- 200% of minimum old-age pension (49.80 UAH):

- group 1 disabled;
- mothers conferred the title "Heroine Mother".

36. Are there any supplements payable to social pensioners?

All non-working retirees, including social pensioners who are over age 60 for men and 55 for women, are eligible for subsistence pecuniary aid. Old-age social pensioners can receive additional payments up to a maximum of 21.9 UAH per month if their pension is less than 46 UAH per month.

37. Who pays for pensions?

Arrangements differ among agricultural enterprises, the self-employed, and other workers. The vast majority of enterprises are required to contribute 32% of each worker's salary, up to 1,000 hryvnias per month. Employees must also contribute. Those making less than 150 hryvnias per month must pay 1% of their wages to the Pension Fund, while those earning in excess of 150 hryvnias pay 2%. Agricultural enterprises make a contribution to the Treasury based on rates per hectare of land under cultivation. The Treasury gives a fixed portion of this revenue to the Pension Fund. Similarly, the self-employed pay a flat contribution to the Treasury, a portion of which is given to the Pension Fund. Agricultural enterprises are supposed to return to a payroll-based contribution beginning in 2003.

The Pension Fund also receives revenues from a variety of other sources. For example, there is excise on automobile purchases, mobile phones, currency transactions, and jewellery purchases. These taxes are supposed to be eliminated once the Pension Fund starts to run a surplus. In addition, the Pension Fund receives contributions from the United Nations, from voluntary contributions, and from reimbursements made by employers for privileged pensions.

Appendix D. Methods, assumptions, and information sources

1. General description of the PROST model

The PROST model was developed by the World Bank. The primary purpose of the model is to allow analysis of pension systems and pension reform proposals. The model uses parameterised input spreadsheets to specify all the assumptions used for the projections, and to define the pension system's benefit formula and contribution scheme. Although the model is parameterised, properly coding the system still requires someone with a strong background in pension system design and finances. As with any model, the quality of the output directly depends on the care and skill with which the input parameters are determined. Because the model is regularly maintained by a skilled team, and because it is relatively easy for experienced professionals as well as government officials to use it, the PROST model is an excellent tool for pension reform analysis. The Bank has a dedicated team of programmers who update and maintain the model regularly. The most recent model is version 10, which was released earlier this year. The Bank has used the model in analyses of pension issues in many countries, and the results of the model have frequently been the basis of Bank projects to support pension reform.

The PROST model is designed to be used with "stock" and "population" parameters. This means the model directly calculates the total number of retirees at each point in time (i.e., the "stock" of retirees), rather than projecting the number of new retirees and the number of retiree deaths, and calculating the total number of retirees. This second method is called the "flow" approach. The World Bank uses the "stock" approach because they believe the total number of retirees is a far more stable and predictable variable than the number of new retirees.

The total number of retirees at any point in time is determined by first specifying the percentage of the population at each age which is retired. At the beginning of the projection period, this number can be directly calculated by simply dividing the number of retirees at a given age by the total population at that age. If pension eligibility is not changed, the basic presumption is that these percentages should remain relatively constant over time. Consequently, as the structure of the total population changes, the structure of the retired population will change proportionately.

The model uses a similar approach to calculate the size of the labour force at any point in time. The user specifies the percentage of the population employed by age and sex. This percentage is then multiplied by the population to get the total size of the labour force. This is called the "population" approach, as opposed to the "employment" approach, in which the labour force and other variables are expressed as a percentage of those employed rather than as a percentage of the population. The World Bank argues that employment statistics in most developing nations are poorly measured and unreliable. While the population statistics are also imperfect, they are more accurate and stable than employment numbers. Consequently, the PROST model usually expresses parameters as percentages of the population, and then directly calculates the totals rather than by projecting flows.

Of course, there are well-developed theoretical relationships between the stock and flow approaches and between the employment and population approaches. While a thorough discussion of this issue is beyond the scope of this paper, it is worth noting that in the course of our analysis, we encountered some anomalies in some starting values of variables as a percent of the population. This is because the various counts by age and of the total population were not measured at the same date, and because some of the distributions by age had to be estimated. We "smoothed"

these anomalies over a period of ten years in our analysis in order to avoid any sharp discontinuities in projections.

PROST is a fairly general model. This means that many needed parameters have to be derived independently first, and then input to the model. Two additional tools have been used for this purpose. The first is a personified database of all pensioners for Mykolaiv oblast. The second is a short-term Excel model that provides much more detail than the PROST model. This model projects only through 2010, but contains detailed statistics and disaggregates benefits into more components. In many cases, we have imported analysis from the Excel model into the PROST model. For example, when determining the impact of the September 1, 1999 increase in minimum and maximum pensions, it is not sufficient to simply estimate the impact for a pensioner receiving the average pension. The impact of the change in the minimum and maximum pensions affects low income pensioners very differently from the way it affects high income pensioners. Consequently, we calculated impacts on pensioners in many different economic circumstances, weighted the results by the proportion of pensioners of each type in the country, and entered the weighted average into the model. We did this by calculating benefits before and after the change on each of Mykolaiv oblast's 300,000 pensioners. If this procedure is not followed, the output will be seriously flawed.

The same procedures were used to make projections of the draft law. The draft law introduces a maximum wage cap, phases out the maximum benefit, and introduces a flat accrual rate formula. This affects pensioners differently according to their year of retirement and level of earnings. Making a single estimate for an "average individual" would give a misleading result. Therefore, we analysed impacts on different types of individuals and weighted results to determine the "average" impact. In other words, the average impact is not equal to the impact on the average person. To avoid this problem, we developed a special spreadsheet that determines impacts on retirees at different income levels and who retire in different years.

We employed several other methodological issues, the most important of which are:

- All calculations are on an accrual basis, and ignore existing debts of enterprises to the Pension Fund, whether due to non-payment of wages or for other reasons. Calculations also ignore all existing benefit payment arrears.
- All calculations are for the Pension Fund only, and fully incorporate the government's plan to move expenditures on social pensions and pension supplements back to the State Budget. There is a major issue of how the government plans to pay for these social programs from the budget. Shifting these payments from the Pension Fund to the budget obviously does not reduce total payments but does recognise that these are social assistance payments, not pension insurance payments.
- Our projections do not include payments made to non-career military personnel, payments to Chernobyl beneficiaries, or any other payments that are not the responsibility of the Pension Fund. Therefore, Pension Fund expenditures do not include payments to these beneficiaries, even though the payments are made by the Pension Fund on behalf of others. Similarly, Pension Fund revenue does not include the reimbursements received from these other organisations.

2. *General spreadsheet*

Base and end years: Our base year is 1998. However, since it is now late 2000, we calibrated our assumptions to also reproduce 1999 results. We selected a 75-year period because this allows us to follow almost all Ukrainians who are alive today through their entire expected lifetime. This also allows us to study both the transition from the old to the reformed system, which lasts about 40 years, and also to study how the new system behaves in the 35 years following transition. A 75-year period is also the standard for actuarial projections of the U.S. Social Security system.

1998 base year information: This information was all taken from published reports of the Ministry of Labour and Social Policy, Ministry of Economy, and Derzhkomstat (State Statistics Committee). The purpose of the starting GDP number is to allow key pension variables to be expressed in absolute terms, and also as a percentage of GDP.

Average wage: This is taken from Derzhkomstat reports. It represents the average reported wage for full-time workers in the formal sector of the economy. The 1998 average wage, when projected forward, is equal to the projected average wage for 1999 from Derzhkomstat.

Demographic trends: The mortality rate for disabled pensioners and social pensioners (many of whom are disabled), is assumed to be 20% higher than the mortality for other citizens.

Macroeconomic trends, and wage growth elasticity with respect to GDP: These sections contain the key macroeconomic variables – inflation, real GDP growth, real wage growth, and real interest rates. This section also contains "load factors" for miscellaneous revenue and expense of the Pension Fund of Ukraine. The macroeconomic variables were estimated by the International Centre for Policy Studies, and are generally more optimistic than official government forecasts. The revenue load factors were derived by examining the size of miscellaneous sources of revenue compared to revenue from payroll contributions. This was converted into a percent increase factor. The largest component of the miscellaneous sources of revenue is excise taxes on jewellery, cars, currency transactions, mobile phones and other luxury items. These taxes are supposed to expire once there is a surplus in the Pension Fund of Ukraine. Based on our models, this occurs in 2002, so this source of revenue has been eliminated, beginning in 2003.

The expense load factors were derived by examining the size of miscellaneous sources of expense compared to benefit payments to pensioners. This includes such items as childcare allowances, funeral allowances and payments to public servants. This factor becomes negative starting in 2000, since it is used to reflect the government's separation of sources of financing program. In 2000, social pensions, payments to some civil servants and certain supplements are moved to the State budget. In 2001, remaining supplements and payments to war veterans are moved to the budget. Social pensions are directly reflected in the model by setting the percent of the population receiving social pensions to zero in 2000. The other items are moved by using a negative load factor.

Pension age and length of service at retirement: This field represents the standard age when males and females begin receiving pensions and the average amount of service on this date. If the benefit formula approach (discussed later in the Appendix) is not used, the length-of-service factors have little effect on the financial projections. They are used only to determine the implicit pension debt. Retirement age, however, does have an impact on assumed labour force participation rates, unemployment rates, and rates of retirement as a percentage of the population.

Pension contribution and collection rates: The pension contribution rate is 32% from employers and either 1% or 2% from employees. Those earning more than 150 hryvnia per month must contribute 2% of their wages to the Pension Fund, while those earning less contribute only 1%. Since 150 hryvnias is slightly less than the average 1999 wage of 175.87 hryvnias, the average contribution rate is 33.6%. We have kept this rate constant over time, because we assumed both the 1,000-hryvnia and 150-hryvnia limit would increase proportionately to wages. Otherwise, in a few years, all workers would be contributing 2% of wages.

The collection rate variable is supposed to represent the proportion of contributions collected from those who actually contribute. A different variable – the exemption and evasion rate – is used to estimate the number of workers who are either exempted from contributing or evade contributions entirely. In actuality, we use this variable as a balancing item to match the Pension Fund's actual results. For example, the average wage of contributors is actually less than the average wage of formal sector full-time workers, primarily because many part-time workers make contributions to the Pension Fund. Also, many registered employers make contributions on an "offi-

cial" salary, and not on the actual salary paid to workers. Somewhere, an "adjustment" must be made to accurately reflect the actual contributions collected by the Pension Fund. This collection variable is used as the balancing item to increase the accuracy of the projections.

We also adjusted our calculations to reflect loss of revenue between 1999 and 2002 due to the agricultural flat tax. Based on estimates in our Excel model, we reduced revenue by 7.5% for those years. This adjustment factor was eliminated in 2003, when agricultural enterprises begin paying payroll-based taxes again. Another possible approach would have been to reduce the number of contributors in those years. This would have been much more complex to code in the PROST model. Consequently, we did not adjust the number of contributors, and used the collection rate variable instead.

In our analysis, we assumed personification will increase compliance over time among registered, formal sector employers. Personification provides a powerful incentive for employees to demand their employers make contributions on their full wages, since this personified wage history will be the basis for benefit calculations at retirement. However, we did not assume that personification would cause employers to move from the shadow economy into the formal economy. We believe significant additional economic reforms would be needed to reduce the size of the shadow economy.

Replacement rate, survivor and social pensioners: Total and average benefits for survivor and social pensioners were obtained from Report #94 of the Ministry of Labour and Social Protection. Percentage adjustment factors for the September 1, 1999 increase in the minimum and maximum benefits were derived by recalculating benefits using a personified database for Mykolaiv oblast. The replacement ratio was then calculated by dividing the average benefit for each group by the average wage in the economy.

Pension indexation: According to the law, "On Indexing Money Income of People", pension benefits are indexed to changes in the consumer price index. Whenever the cumulative index increases by more than 5% since the date of the last indexing, pensions are adjusted. Specific instructions for indexing are contained in Cabinet of Ministers Decree Number 2034, dated December 21, 1998. These instructions actually produce indexing that is less than inflation. Our indexing factors for 1999 and 2000 reflect actual indexing granted during each year. It also reflects the increase in the minimum and maximum benefits effective September 1, 1999. We determined the impact of this indexing using our personified Mykolaiv database, and translated it into an equivalent indexing factor for purposes of modelling.

Administrative cost: This is the cost of pension system administration as a percent of benefit payments. The starting value is the cost today as derived from the Pension Fund's financial statements. One of the reasons for the high cost in Ukraine is the excessive charges levied by Bank "Aval" and the post office for their delivery services. Over time, this cost must be reduced. The 2% cost for 2073 is the average cost of a well-run system in Western Europe or the United States. Expenses are assumed to decrease linearly over the 75-year period.

Other variables: Not used. No impact on results.

3. Population spreadsheet

Population by age and sex on January 1, 1998: We examined population information from several different sources including population projections from an earlier study by Tacis, projections from Derzhkomstat, augmented with the results of extensive discussions with both Ella Libanova and Valentyna Steshenko from the National Academy of Sciences. We selected the Tacis study as the basis, but, because Tacis data is as of the start of the year and PROST input data must be the average population over the course of the year, we averaged projected values for the beginning and end of 1998 to estimate starting values.

Fertility: Starting fertility rates by age were available from Tacis and the National Academy of Sciences. We also reviewed fertility projections for Ukraine and other Eastern European countries, and the history of fertility in the former Soviet Union. Ultimately, we decided to use fertility rates that increase from 1.3 today to 1.8 by the year 2030. If the fertility rate is left unchanged, the population of Ukraine declines by nearly 40% after 50 years. This seems unlikely. On the other hand, almost all projections show a population decline. Our assumed mortality rate leads to an 18% population decline over a 50 year period and 28% over 75 years – still quite significant. Our population projections as of 2030 are slightly higher than the National Academy's and less than government projections.

Mortality: Starting mortality rates were obtained from 1994 and 1995 Derzhkomstat studies of Ukrainian mortality. These rates are considerably higher than mortality rates in Ukraine in the 1980s, and should decline over time, with economic growth and improvements in health care. We studied mortality rates for a variety of North American, Eastern and Western European countries and in the former Soviet Union. These rates were obtained from the UN 1994 Demographic Almanac. Ultimately, we decided to use U.S. 1991 mortality for the ultimate Ukrainian mortality rates in 2073. Mortality rates were assumed to decline linearly over 50 years, and then remain level. While the selection of ultimate mortality rates is somewhat arbitrary, studies done by our project and others shows that changes in mortality have less effect on the population and pension system projections than fertility rates.

Net migration: Since independence, Ukraine has experienced net emigration – mostly to the West, Israel or Russia. Over the longer term, Ukraine can expect to experience net immigration, especially from poorer and more crowded Central Asian republics, and perhaps from the return of diaspora Ukrainians. Based on discussions with the National Academy of Sciences, we project continued net emigration for the next few years of about 100,000 people per year. However, our long-run assumption is net immigration of 30,000 per year, about the level prevailing in Soviet days.

4. Labour spreadsheet

Labour force participation rate and unemployment rate: The 1998 labour force study by Derzhkomstat was used as the basis for calculating labour force participation rates and unemployment rates.

Earnings profile: These variables were not used in our analysis. The earnings profile is used only if the user chooses to use a benefit formula approach instead of a replacement ratio approach.

5. Pension spreadsheet

Number employed: The total number of employed Ukrainians in the formal and informal sector combined is calculated. It is equal to the population multiplied by the employment coverage rate (discussed below).

Number of existing pensioners: The model requires pensioners to be divided into four different types: old-age pensioners, disabled pensioners, survivors and social pensioners. The total number of pensioners by type was taken from Report #94 as of January 1, 1998. However, this report does not provide information about benefits by age and sex. To disaggregate, we used the personified database for Mykolaiv oblast to get these distributions and then extrapolated to all pensioners. In addition, the PROST model does not project new pensioners in the first year of the model. This means the figures put into the model must represent the average number of pensioners for the year rather than the number at the beginning of the year. Consequently, we adjusted the beginning of the year numbers, based on projections from our Excel model.

Employment coverage as a percent of the population: The total number of workers each year is computed from these percentages. Employment coverage is equal to the product of the labour force

participation rate – which shows the percent of the total population at each age who are capable of working – and the employment rate (which is equal to one minus the unemployment rate).

Retirement, disability, survivor and social pensioner rates as a percent of the population: This is the percent of the population, by age and sex, in each of these four categories each year. The initial values are derived by dividing the number of such pensioners at the beginning of the projection period by the population at the beginning of the projection period. We analysed these percentages for reasonableness. In many cases, the pattern of rates by age seemed questionable. Consequently, we developed a "smoothed" set of percentages, phased in over 10 years. We also recognised that the percentage of the population receiving disability and survivor benefit today will change significantly in the future. Today there are many very old Ukrainians receiving disability and survivor benefits, because of the Second World War. The number of such pensioners should decline sharply in the future due to mortality, and there will not be an equivalent number of new disabled pensioners and survivors to take their place. Consequently, we developed a set of "ultimate" percentages, and coded the model to grade smoothly from the current to the ultimate percentages over 10 years. This corrected the theoretical errors, and also produced a smooth transition and reasonable results over the transition period.

Evasion and exemption rate: The evasion and exemption rate is the percent of the official labour force that does not make contributions to the pension system – either because they are not required to make contributions by law, or because of evasion. In Ukraine, this includes career military personnel, who have their own pension system and are not required to contribute to the Pension Fund, and the shadow economy, which evades their responsibility to make contributions. In the PROST model, the evasion and exemption rate is the link between the number of workers and the number of contributors. To calculate this rate, we estimated the number of contributors using our Excel model (as described below), and then used this to calculate the evasion and exemption rate. Because this data is aggregated, we were forced to assume that the evasion rate was the same by age and sex. Of course, this is unlikely to be true. Further analysis is needed in this area.

Number of contributors: The Pension Fund has little reliable data on the number of contributors. This is because enterprises make a single lump-sum contribution to the Pension Fund on behalf of all its employees. During this year, all employers are required to report personified data for their employees. By early next year, a much more accurate measure of the number of contributors and their characteristics should be available. In the absence of full-personified information, we used Pension Fund budget aggregates to calculate the approximate number of contributors. The Pension Fund gave us information regarding the number of formal sector workers in the economy, total number of theoretical contributors, expected contributions, payroll basis for those contributions, and the theoretical wage fund for all potential contributors. Using our Excel model, we tried different combinations of the various parameters affecting total contributions until we found a reasonable set of variables that roughly reproduced the Pension Fund data we were given. Based on this technique, we estimated there were about 16.2 million contributors to the Pension Fund in 1998.

Old-age and disability replacement rates: These variables are used to calculate the benefits which will be received by future retirees. It is the ratio of benefits at retirement to pay at retirement. We estimated the starting values using Report 94 as of January 1, 1998, which shows the average benefit payable by type of retirement to those who retired in 1997. The replacement ratio for old-age pensioners reflects the actual pay and length of service of retirees just prior to the time they retired, the current mix of ordinary pensioners and privileged pensioners, and the impact of the maximum and minimum pension provisions. It is not correct to calculate the benefit for an individual making the average wage with the average length of service, and use this replacement ratio. This fails to reflect the skewed distribution of pay in Ukraine – many workers receiving low wages and few receiving high wages. The current benefit formula produces very different re-

placement ratios, depending on pay at retirement. Consequently, the replacement ratio used in the model must accurately reflect the actual mix of pay levels, and the actual mix of ordinary and privileged pensioners. We developed a separate model that projects replacements ratios by year of retirement, level of pay, and benefit formula characteristics. The method used to calculate disability replacement ratios was also based on Report #94.

6. Adjustments to reflect the draft Law

The draft law introduces many changes that are challenging to program using the PROST model. Of greatest importance are the changes in pension age and the changes affecting the calculation of benefits – accrual rates, maximum cap phase-out, and introduction of the wage cap. PROST provides several automatic tools to reflect changes in retirement rates. Essentially, PROST automatically adjusts labour force participation rates, unemployment rates, employment coverage rates, and retirement and disability rates as a percent of the population to reflect the increased retirement age. Workers are assumed to remain in the work force longer and make contributions for a longer period of time.

To determine the impact of the draft law on the replacement rates requires careful modelling. The average impact will not be equal to the impact on the average person earning the average wage. The only good way to determine the impact is to determine replacement ratios for individuals of different ages and with different earnings, under the current and draft laws, and then calculate the weighted average and use it as input to the model.

Our "best-estimate" PROST coding assumes that over time the overall economic situation in Ukraine will improve. In the short run, the economic outlook is poor. However, we assumed in the long run economic growth will be accompanied by significant increases in wages, growing GDP, improving general health conditions, increased fertility, and declining mortality. If economic progress is not made, then all social protection systems, including pensions, will face severe problems. Only economic growth can allow for improvements in the lives of Ukrainians and stability in its social and financial programs. Consequently, our best-estimate analysis assumes that at least moderate economic growth and social development will occur.

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